APPENDIX A

Required Environmental Permits and Consultations

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Introduction

This appendix discusses required permitting and public, agency, and tribal involvement in the preparation of the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) Project (the Project) environmental impact statement (EIS). This involvement included formal consultations, cooperating agency exchanges, and a public scoping comment period.

Authorizations and permits are listed in Table A-1, and cooperating or participating federal agencies are described below. The Bureau of Ocean Energy Management (BOEM) has completed the following interagency milestones to date for the Project:

- Finalize purpose and need: April 19, 2021
- Concurrence on permitting timetable: April 19, 2021
- Issuance of notice of intent (NOI) to prepare an EIS: April 30, 2021
- Issuance of notice of correction: June 4, 2021
- Complete public scoping period: June 11, 2021
- Finalize Draft EIS alternatives: April 19, 2022

Other Federal and State Review

Table A-1 provides a discussion of other federal and state reviews required, including legal authority, jurisdiction of the agency, and the regulatory process involved.

Table A-1. Cooperating Federal and State Agencies, Required Environmental Permits, and Consultations for the Project

Agency/Regulatory Authority	Cooperating Agency Status	Permit/Approval/Consultations	Status
Federal			
Advisory Council on Historic Preservation	Participating agency	None	Not applicable
BOEM	Lead federal agency	Construction and operations plan (COP) approval	Original COP filed with BOEM on October 30, 2020; COP update provided on April 29, 2021; COP update provided on December 15, 2021; COP update provided on July 21, 2022
National Park Service	Participating agency	None	Not applicable
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service	Cooperating agency	Letter of authorization (LOA) for incidental take regulations (ITRs) Essential fish habitat consultation Endangered Species Act (ESA) consultation	Planned
U.S. Department of Defense, U.S. Army Corps of Engineers	Cooperating agency	Clean Water Act Section 404/Rivers and Harbors Act of 1899 Section 10 Individual Permit	Planned
U.S. Department of Defense	Participating agency	None	Not applicable
U.S. Department of Transportation, Federal Aviation Administration	Participating agency	Obstruction evaluation/airport airspace analysis	Planned
U.S. Department of Homeland Security, U.S. Coast Guard	Cooperating agency	Private Aids to Navigation Permit	Planned

Agency/Regulatory Authority	Cooperating Agency Status	Permit/Approval/Consultations	Status
U.S. Department of the Interior, Bureau of Safety and Environmental Enforcement	Cooperating agency	None	Not applicable
U.S. Department of the Navy	Participating agency	None	Not applicable
U.S. Environmental Protection Agency	Cooperating agency	Outer Continental Shelf Air Permit	Planned
U.S. Fish and Wildlife Service	Participating agency	ESA consultation	Not applicable
State (portions of the Project within state jurisdiction)*			
State of Rhode Island Coastal Resources Management Council	Cooperating agency	Coastal Zone Management Act (CZMA) Consistency Certification Category B Assent/Submerged lands license Permit to Alter Freshwater Wetlands in the Vicinity of the Coast Application for Marine Dredging and Associated Activities	Filed on June 7, 2021 Filed on July 1, 2021 Filed on July 1, 2021 Filed on July 1, 2021
State of Rhode Island Department of Environmental Management	Cooperating agency	Section 401 and State Water Quality Certification/Rhode Island Pollutant Discharge Elimination System Construction General Permit (filed concurrently) Application for Marine Dredging and Associated Activities (see above)	Filed on August 3, 2021
Commonwealth of Massachusetts Office of Coastal Zone Management	Cooperating agency	CZMA Consistency Certification	Filed on June 7, 2021
Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development	Not applicable	National Historic Preservation Act (NHPA) Section 106 consultation	Not applicable

Agency/Regulatory Authority	Cooperating Agency Status	Permit/Approval/Consultations	Status
Rhode Island Historical Preservation & Heritage Commission	Not applicable	NHPA Section 106 consultation	Not applicable
New York State Division for Historic Preservation	Not applicable	NHPA Section 106 consultation	Not applicable
Massachusetts Historical Commission	Not applicable	NHPA Section 106 consultation	Not applicable

* State agencies may be cooperating agencies under the National Environmental Policy Act.

Cooperating Agencies

As part of the National Environmental Policy Act (NEPA) process, BOEM invited other federal agencies and state, tribal, and local governments to consider becoming cooperating agencies in the preparation of the EIS. According to Council on Environmental Quality (CEQ) guidelines, qualified agencies and governments are those with “jurisdiction by law” or “special expertise” (40 CFR 1501.8). BOEM asked potential cooperating agencies to consider their authority and capacity to assume the responsibilities of a cooperating agency and to be aware that an agency's role in the environmental analysis neither enlarges nor diminishes the final decision-making authority of any other agency involved in the NEPA process. BOEM also provided potential cooperating agencies participating in the FAST-41 process with a written summary of expectations for cooperating agencies, including time schedules and critical action dates, milestones, responsibilities, scope, detail of cooperating agencies’ contributions, and availability of pre-decisional information.

Cooperating agency status is provided in Table A-1. More specific details regarding federal agency roles and expertise are described below.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) is serving as a cooperating agency pursuant to 40 CFR 1501.8 because the scope of the Proposed Action and alternatives involves activities that could affect marine resources under its jurisdiction by law and special expertise. As applicable, permits and authorizations are issued pursuant to the Marine Mammal Protection Act, as amended (MMPA) (16 USC 1361 et seq.); the regulations governing the taking and importing of marine mammals (50 CFR 216); the Endangered Species Act (ESA) (16 USC 1531 et seq.); and the regulations governing the taking, importing, and exporting of threatened and endangered species (50 CFR 222–226). In accordance with 50 CFR 402, NMFS also serves as the consulting agency under Section 7 of the ESA for federal agencies proposing actions that may affect marine resources listed as threatened or endangered. NMFS has additional responsibilities to conserve and manage fishery resources of the United States, which include the authority to engage in consultations with other federal agencies pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and 50 CFR 600 when proposed actions may adversely affect essential fish habitat (EFH). The MMPA is the only authorization for NMFS that requires NEPA compliance. NMFS intends to adopt BOEM’s Final EIS if, after independent review and analysis, NMFS determines the Final EIS to be sufficient to support the authorization.

NMFS has multiple roles in the NEPA process and EIS for this major federal action. First, NMFS has a responsibility to serve as a cooperating agency based on its technical expertise and legal jurisdiction over multiple trust resources. NMFS’s role is to provide expert advice regarding the action’s impact with respect to EFHs, as defined in the MSA, listed threatened and endangered species and designated critical habitat listed under the ESA, marine mammals protected by the MMPA, and commercial and recreational fisheries managed under the MSA.

Second, NMFS intends to adopt the EIS in support of its MMPA authorization decision after reviewing it and determining it to be sufficient. NMFS is required to review applications for incidental take under the MMPA, as amended (16 USC 1361 et seq.) and issue an ITA in the form of a Letter of Authorization

(LOA) for Incidental Take Regulations (ITRs) if appropriate. Revolution Wind, LLC (Revolution Wind) has submitted an application to NMFS for an ITR in conjunction with the construction and operations plan (COP) for *take*, as defined by the MMPA, of marine mammals incidental to Project construction and associated activities. The decision to issue an ITR under the MMPA is considered a major federal action requiring NEPA review. Therefore, NMFS has an independent responsibility to comply with NEPA. Consistent with the regulations published by the CEQ (40 CFR 1501.7(g)), NMFS intends to rely on the information and analyses in BOEM's EIS to fulfill its NEPA obligations for ITA issuance, if applicable. NMFS intends to adopt the final EIS for this purpose.

Bureau of Safety and Environmental Enforcement

The Bureau of Safety and Environmental Enforcement (BSEE) is serving as a cooperating agency pursuant to 40 CFR 1501.8 because the scope of the Proposed Action and alternatives involves activities that could affect marine resources under its jurisdiction by law and special expertise.

U.S. Coast Guard

The U.S. Coast Guard (USCG) is serving as a cooperating agency pursuant to 40 CFR 1501.8 because the scope of the Proposed Action and alternatives involves activities that could affect navigation and safety issues that fall under its jurisdiction by law and special expertise. Upon lessee application, the USCG will issue a Private Aids to Navigation (PATON) permit for the marking and lighting of the wind turbine generators (WTGs), offshore substations (OSSs), and measurement buoys to alert mariners to potential hazards to navigation. A request for a Local Notice to Mariners (LNMs) publication will also be submitted to the USCG prior to vessel mobilization for construction activities to enable the USCG to issue the LNM.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) is serving as a cooperating agency pursuant to 40 CFR 1501.8 because the scope of the Proposed Action and alternatives involves activities that could affect resources under its jurisdiction by law and special expertise. The EPA is responsible for issuing an Outer Continental Shelf (OCS) permit for the Project under the Clean Air Act.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) is serving as a cooperating agency pursuant to 40 CFR 1501.8 because the scope of the Proposed Action and alternatives involves activities that could affect resources under its jurisdiction by law and special expertise. As applicable, permits and authorizations are issued pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

Section 10 of the Rivers and Harbors Act, approved on March 3, 1899 (33 USC 403), prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The construction of any structure in or over any navigable water of the United States; the excavating from or depositing of material in such waters; or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters is unlawful unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. The instrument of authorization is designated a permit. The authority of the Secretary of the Army to prevent obstructions to navigation in navigable waters of the

United States was extended to artificial islands, installations, and other devices located on the seabed, to the seaward limit of the OCS, by Section 4(f) of the Outer Continental Shelf Lands Act of 1953, as amended (43 USC 1333(e)).

Section 404 of the Clean Water Act (33 USC 1344) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits, after notice and opportunity for public hearing, for the discharge of dredged or fill material into the waters of the United States at specified disposal sites (see 33 CFR 323.) The selection and use of disposal sites will be in accordance with guidelines developed by the Administrator of the EPA in conjunction with the Secretary of the Army and published in 40 CFR 230. If these guidelines prohibit the selection or use of a disposal site, the Chief of Engineers shall consider the economic impact on navigation and anchorage of such a prohibition in reaching their decision. Furthermore, the Administrator can deny, prohibit, restrict, or withdraw the use of any defined area as a disposal site whenever they determine, after notice and opportunity for public hearing and after consultation with the Secretary of the Army, that the discharge of such materials into such areas will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas, wildlife, or recreational areas (see 40 CFR 230).

The Section 10 activities associated with the Project may consist of the installation of WTGs, the installation of inter-array cables, the installation of export cables, and scour protection associated with the structures. Section 10 activities are regulated by the USACE between the mean high water mark and the limits of the OCS. The Section 404 fill activities associated with the Project may consist of the discharge of dredged material associated with the horizontal directional drilling installation at the landfall site, the placement of cable scour protection, the installation of temporary cofferdams, and temporary discharges of dredged or fill material associated with the installation of the export cable. Section 404 activities are regulated by the USACE between the high tide line and the 3-nautical-mile mark.

Issuance of Section 10 or Section 404 permits requires NEPA compliance, which will be met via adoption of BOEM's EIS and issuance of the record of decision.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is serving as a participating agency for the Project. The USFWS also serves as the consulting agency under Section 7 of the ESA for federal agencies proposing actions that may affect terrestrial resources listed as threatened or endangered, including species of concern. See the ESA section below for a summary of the ESA consultation to date with the USFWS.

National Park Service

The National Park Service (NPS) is serving as a participating agency because there are multiple important NPS resources within the Project vicinity, including the Block Island Southeast Light, Marble House, Ocean Drive Historic District, Bellevue Avenue Historic District, and The Breakers National Historic Landmarks (NHLs). There may also be Land and Water Conservation Fund State and Local Assistance Program sites impacted if more export cable locations are set. However, at this point in time the proposed cable landing at Quonset Business Park in North Kingstown, Rhode Island, is not expected to interact with any NPS units or program lands. Should any potential impacts to NPS units or program lands be identified and an NPS permit is required, the NPS will request a change to cooperating agency status under "jurisdiction by law" pursuant to 40 CFR 1501.8.

Consultations

The following section provides a summary and status of BOEM consultations as part of the Project (ongoing, complete, and the opinion or finding of each consultation). Section 1.4 of the COP provides a discussion of other federal and state consultation processes being led by Revolution Wind (vhb 2022).

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) requires that federal actions within and outside the coastal zone that have reasonably foreseeable effects on any coastal use or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program (CMP). On June 7, 2021, Revolution Wind submitted a federal consistency certification with the Commonwealth of Massachusetts Office of Coastal Zone Management (MA-CZM) and the Rhode Island Coastal Resources Management Council (RI CRMC) per 15 CFR 930.76. The CZMA federal consistency regulations at 15 CFR 930.60(b) allow for a stay of the required review period, if mutually agreed upon by both the applicant and the state agency. On July 2, 2021, MA-CZM requested additional information deemed necessary to determine consistency with the enforceable policies of its approved CMP and entered into a mutual agreement with Revolution Wind to stay the review for 8 months, beginning on July 7, 2021, with MA-CZM's review restarting on March 7, 2022. On March 7, 2022, both parties agreed to a second stay ending May 7, 2022.

On October 21, 2021, RI CRMC also requested additional information deemed necessary to make a consistency determination. On October 28, 2021, RI CRMC and Revolution Wind entered into an agreement to stay the CRMC's CZMA review until September 17, 2022.

At this time, Revolution Wind and these state agencies have mutually agreed to the following consistency decision dates:

- Massachusetts: October 7, 2022
- Rhode Island: December 21, 2022

The COP provides the necessary data and information under 15 CFR 930.58 (vhb 2022). The states' concurrence is required before BOEM could approve, or approve with conditions, the COP per 30 CFR 585.628(f) and 15 CFR 930.130(1).

Endangered Species Act

Section 7(a)(2) of the ESA of 1973, as amended (16 USC 1531 et seq.), requires that each federal agency ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of those species. When the action of a federal agency could affect a protected species or its critical habitat, that agency is required to consult with either NMFS or the USFWS, depending upon the jurisdiction of the agencies. Pursuant to 50 CFR 402.07, BOEM has accepted designation as the lead federal agency for the purposes of fulfilling interagency consultation under Section 7 of the ESA for listed species under the jurisdiction of NMFS and the USFWS. BOEM is consulting on the proposed activities considered in this EIS with both NMFS and the USFWS for listed species under their respective jurisdictions. Draft biological assessments have been prepared for submission to USFWS and NMFS. ESA consultations are expected to be completed by March 31, 2023.

Government-to-Government Consultation with Federally Recognized Indian Tribes

Executive Order (EO) 13175 commits federal agencies to engage in government-to-government consultation with tribal nations, and Secretarial Order No. 3317 requires U.S. Department of the Interior agencies to develop and participate in meaningful consultation with federally recognized tribal nations where a tribal implication may arise. A June 29, 2018, memorandum outlines BOEM's current tribal consultation policy (BOEM 2018). This memorandum states that "consultation is a deliberative process that aims to create effective collaboration and informed Federal decision-making" and is in keeping with the spirit and intent of the National Historic Preservation Act (NHPA) and NEPA, executive and secretarial orders, and U.S. Department of the Interior policy (BOEM 2018). BOEM implements tribal consultation policies through formal government-to-government consultation, informal dialogue, collaboration, and engagement.

BOEM conducted government-to-government consultations with the Narragansett Indian Tribe, the Mashantucket Pequot Tribal Nation, and the Mohegan Tribe of Indians of Connecticut in an overview of planned offshore wind development projects off southern New England in August 2018.

Between January 15 and 17, 2020, BOEM met again with the Mohegan Tribe of Indians of Connecticut, the Mashantucket Pequot Tribal Nation, and the Narragansett Indian Tribe to discuss multiple BOEM actions in the Rhode Island/Massachusetts Wind Energy Area. Concerns expressed by representatives from the tribes present included possible effects on marine mammals, other marine life, and the Nantucket Sound Traditional Cultural Property (TCP). One tribe emphasized the importance of open sea views to the east during sunrise, as well as the night sky, while others emphasized their long historical association with the sea and islands off southern New England and the critical role of fishing and shellfish gathering. All of the tribes emphasized the importance of understanding the interconnected nature of the human world, the sea, and the living things in both worlds.

On July 21, 2020, BOEM and the BSEE conducted three separate meetings with the Mashantucket Pequot Tribal Nation, the Wampanoag Tribe of Gay Head (Aquinnah), and the Mashpee Wampanoag Tribe. These meetings generally focused on developing mitigation measures for offshore wind project impacts, funding, and best practices. Concerns expressed by representatives from the tribes present included project effects and layout, a desire to redefine the Nantucket Sound TCP boundaries, recommendations for mitigation measures, aboriginal rights and titles, communication with developers, and cumulative effects of the present and future offshore wind projects in the area.

On August 20, 2020, BOEM consulted with the Delaware Tribe of Indians, Mashantucket Pequot Tribal Nation, Mashpee Wampanoag Tribe, and Wampanoag Tribe of Gay Head (Aquinnah) to discuss the impacts of offshore wind developments on marine mammals. This included an overview of the consultation process and environmental review, the BOEM Environmental Studies Program and process, existing and upcoming studies related to North Atlantic right whales, and the marine mammal analysis and findings noted in the Vineyard Wind 1 supplemental EIS. The meeting concluded with some action items for BOEM, including to provide the above-referenced consulting parties with additional reports and to research funding options to provide tuition assistance for tribal members interested in participating in the Protected Species Observer training certificate program.

On March 12, 2021, BOEM consulted with the Mashpee Wampanoag Tribe and the Wampanoag Tribe of Gay Head (Aquinnah) to discuss the proposed nomination of a TCP district to the National Register of Historic Places (NRHP) off the coast of Massachusetts. The TCP district proposed by the two Wampanoag tribes would encompass the lands and waters associated with the Wampanoag culture hero Moshup, including the Nantucket Sound TCP and the Vineyard Sound and Moshup's Bridge TCP identified during consultations for the Vineyard Wind 1 Project. The representatives from the tribes informed BOEM that the proposed TCP district was best described as a cultural landscape: a geographic area, including both cultural and natural resources and the wildlife therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. The representatives from the tribes stated that, in their opinion, any nomination should not be limited to the activities and lands associated with Moshup but also include detailed documentation of Wampanoag history in the area, such as their participation in the whaling industry, detailing the role the Wampanoag peoples have played in the history of the region. In a subsequent meeting on April 15, 2021, BOEM informed the representative from the Wampanoag Tribe of Gay Head (Aquinnah) that BOEM's Environmental Studies Program had developed a proposal for a collaborative ethnographic and historic research project with the Wampanoag Tribe of Gay Head (Aquinnah) and the Mashpee Wampanoag Tribe to collect, document, and report information that could be used by the tribes to complete an NRHP nomination for the proposed TCP district.

On April 9, 2021, BOEM held a government-to-government consultation meeting with representatives from the Delaware Tribe of Indians, Mashantucket Pequot Tribal Nation, Mashpee Wampanoag Tribe, and Wampanoag Tribe of Gay Head (Aquinnah). Most of the meeting focused on topics and issues applicable to all proposed offshore wind projects off the coast of New England, including the Project. During the meeting, representatives from the tribes voiced concerns about potential Project-based and cumulative impacts to water quality; marine mammals; coastal habitats; benthic communities; culturally, economically, and historically significant fisheries and shellfish populations; chemical pollutants; the financial and time burden on tribes of participating in multiple, simultaneous offshore wind project reviews; visual impacts on TCPs; and preserving the marine and terrestrial environments for future generations, particularly the current and future ability of tribal youth to perform sacred ceremonies and have safe havens for traditional cultural practices in the future. In addition to discussing these concerns, representatives from the tribes also recommended that BOEM consider creating a single offshore export cable corridor for all projects off the coasts of Rhode Island and Massachusetts and requested that BOEM consult with federally recognized tribes on all proposed offshore wind projects as a single federal action rather than on a project-by project basis.

In April 2021, BOEM invited by individual letter and email the 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, and Delaware Nation to join the EIS process as cooperating agencies, to participate in scoping, to meet government-to-government on the Project, and to consult under NHPA Section 106. The invitations and the NOI for the Project notified tribes that BOEM would be using the NEPA substitution process for completing the steps of NHPA Section 106 pursuant to 36 CFR 800.8. (See National Historic

Preservation Act section below.) BOEM had earlier, in December 2020, notified the consulting tribes of its intent to apply this NEPA substitution process on its future offshore wind development reviews and held a workshop on this process open to tribes in January 2021.

Officials with the Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, and Wampanoag Tribe of Gay Head (Aquinnah) have attended cooperating agency meetings to date. BOEM received comments from the tribes during June 2021 cooperating agency meetings in the scoping of alternatives and weighed these in the identification of alternatives to consider in detailed EIS analyses. The Mashantucket Pequot Tribal Nation and the Wampanoag Tribe of Gay Head (Aquinnah) also provided written comments for scoping. Comments received from tribes on alternatives included a co-located export cable corridor to be shared with other offshore projects and RWF setbacks and different configurations of WTG layouts to protect the environment (water, wildlife, and other natural and heritage resources) as well as to set back WTGs from land to address visual and cultural impact concerns. A setback option that would restrict/maximize the distance of WTGs from Massachusetts islands was carried forward by BOEM to detailed analyses (i.e., Alternative E). A marine habitat alternative (Alternative C) was also carried forward to detailed analysis based on the comments of many consulting parties, including participating tribes. A draft scoping report was provided for cooperating agency review in June 2021, including to participating tribes.

On August 2, 2021, BOEM held a government-to-government meeting with the Wampanoag Tribe of Gay Head (Aquinnah) to discuss visual effects from the South Fork Wind Farm (SFWF) and RWF. The Wampanoag Tribe of Gay Head (Aquinnah) provided comments, and BOEM responses on the agency's tribal consultation practices to date on offshore wind development and the tribe's expressed concerns with the proximity of the SFWF and RWF lease areas and the consideration of alternatives.

On August 13, 2021, BOEM held a government-to-government meeting on RWF and Vineyard Wind South with the Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, Wampanoag Tribe of Gay Head (Aquinnah), Delaware Tribe of Indians, and Delaware Nation. The meeting discussed BOEM's decision to use the NEPA substitution process for NHPA Section 106 compliance; cooperating agency status for tribes during NEPA EIS development; tribal land considerations on the OCS; power purchase agreements; BOEM's use of project design envelopes for project reviews; export cables; vessel traffic corridors; horizontal directional drilling at landfall sites; terrestrial archaeology; cumulative visual impacts; traditional cultural practices; potential impact to marine mammals; and project schedules and FAST-41.

On February 3, 2022, BOEM held a government-to-government meeting on RWF with the Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, and Wampanoag Tribe of Gay Head (Aquinnah). The meeting discussed tribal land considerations on the OCS, export cables, terrestrial archaeology, marine archaeology, alternatives, cumulative visual impacts, Project schedule, and FAST-41.

On May 2, 2022, BOEM held a government-to-government meeting specifically with the chairwoman, tribal historic preservation office, and council members of the Wampanoag Tribe of Gay Head (Aquinnah). In the meeting, BOEM introduced and discussed the overall renewable energy program and process and summarized details and status of projects off the coast of New England. Topics identified for future discussion included cumulative visual simulations and resource impacts, the transmission process that is part of a lease, decommissioning process and oversight, proposed mitigation plans and agreements, and the tribal capacity building initiatives.

On June 1, 2022, BOEM held a government-to-government meeting with the chairwoman and council members of the Wampanoag Tribe of Gay Head (Aquinnah). This meeting was a follow-up to the May 2 meeting to continue the conversation on various topics and tribal concerns related to the Project as well as to offshore wind development off the New England coast collectively.

On June 2, 2022, the BOEM director met in-person with the Mashpee Wampanoag Tribe to provide the tribal council with an overview of the current state of wind farm permitting off the coast of New England, including Gulf of Maine; to discuss and receive feedback on the Project and regional biological and economic concerns and potential mitigation strategies; to discuss and receive feedback on cumulative visual impacts and simulations; and to discuss and receive feedback on other programmatic topics, including transmission as part of a lease and capacity building initiatives.

BOEM continues to consult with these and other tribes on developments in offshore wind. Additional government-to-government consultations are planned for the future.

As part of COP development, Revolution Wind also conducted prior coordination with engaged tribes, State Historic Preservation Officers, and other stakeholders identified as having potential to inform the design process (see COP Appendix A).

Marine Mammal Protection Act

The MMPA was enacted to protect and conserve marine mammals and established a general moratorium on the taking and importation of marine mammals, with certain enumerated exceptions. Unless an exception applies, the act prohibits persons or vessels subject to the jurisdiction of the United States from taking any marine mammal in waters or on lands under the jurisdiction of the United States or on the high seas (16 USC 1372(a)(1), (a)(2)). Section 101(a) of the act provides the prohibitions for the incidental taking of marine mammals. The incidental take of a marine mammal falls under three categories: mortality, serious injury, or harassment (i.e., injury and/or disruption of behavioral patterns). Sections 101(a)(5)(A) and (D) of the act provide the exceptions to the prohibition on take, which give NMFS the authority to authorize the incidental but not intentional take of small numbers of marine mammals, provided certain determinations are made and statutory and regulatory procedures are met. Entities seeking to obtain authorization for the incidental take of marine mammals under NMFS jurisdiction must submit such a request (in the form of an application). Incidental Take Authorizations (ITAs) may be issued as either 1) regulations and associated letters of authorization or 2) incidental harassment authorizations when a proposed action will not result in a potential for serious injury and/or mortality or where any such potential can be negated through required mitigation measures. NMFS also promulgated regulations to implement the provisions of the MMPA governing the taking and importing of marine mammals (50 CFR 216) and produced Office of Management and Budget (OMB)–approved application instructions (OMB Number 0648-0151) that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Once NMFS determines an application is adequate and complete, NMFS has a corresponding duty to determine whether and how to authorize take of marine mammals incidental to the activities described in the application. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to determine whether the take would have a negligible impact on the affected marine mammal species or stocks and an unmitigable impact on their availability for taking for subsistence uses. NMFS must also prescribe the "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, and on the availability of those species or stocks for subsistence uses, as well as monitoring and reporting requirements.

NMFS received an application for an ITR from Revolution Wind, which was deemed complete on February 28, 2022, and published in the *Federal Register* on March 21, 2022 (National Oceanic and Atmospheric Administration 2022). As outlined above, NMFS reviews applications to determine whether to issue an authorization for the activities described in the application.

National Historic Preservation Act

The NHPA (54 USC 306108 *et seq.*) requires federal agencies to consider the effects of their undertakings on historic properties, to the maximum extent possible plan and act to minimize harm to NHLs, and afford the Advisory Council on Historic Preservation an opportunity to comment. BOEM has determined that approving a COP constitutes an undertaking subject to Section 106 of the NHPA and is implementing the Section 106 process (36 CFR 800). The construction of WTGs, installation of electrical support cables, and development of staging areas are ground- or seafloor-disturbing activities that could directly affect archaeological resources. The presence of WTGs could also introduce visual elements out of character with the historic setting of historic structures or landscapes; in cases where historic setting is a contributing element of historic properties' eligibility for the NRHP, the Project could affect those historic properties, including NHLs. NHLs that may be affected by the undertaking will be addressed according to Section 110(f) of the NHPA pursuant to 36 CFR 800.10.

The regulations at 36 CFR 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR 800.3–800.6. This process is known as "NEPA substitution for Section 106," and BOEM is using this process and documentation prepared under NEPA to also comply with Section 106. Under NEPA substitution for Section 106 (NEPA Substitution), BOEM is using the public involvement requirements under NEPA to also seek public involvement in its Section 106 review, pursuant to 36 CFR 800.2(d)(3). EIS Appendix J includes BOEM's draft finding of adverse effect, which includes a description and summary of BOEM's consultation to date. BOEM will continue consulting with the Connecticut, Rhode Island, Massachusetts, and New York SHPOs; ACHP; federally recognized tribal nations, and the consulting parties regarding the finding of adverse effect and the resolution of adverse effects. BOEM has and will be conducting Section 106 consultation meeting(s) on the finding of adverse effect and the resolution of adverse effects, and the agency will be requesting the consulting parties to review and comment on the finding of adverse effect and proposed resolution measures. Through NEPA Substitution, resolution of adverse effects will be documented in a memorandum of agreement (MOA) with the consulting parties, concluded prior to the issuance of the record of decision.

BOEM fulfilled public involvement requirements for Section 106 of the NHPA through the NEPA public scoping and public meetings process, pursuant to 36 CFR 800.2(d)(3). The scoping summary report (SWCA Environmental Consultants n.d. [2021]), available on BOEM's Project-specific website, summarizes comments on historic preservation issues. BOEM initiated review under NEPA Substitution on April 2, 2021, with letters sent to identify consulting parties for this undertaking sent between April 2 and 20, 2021. Letters were then sent between May 11 and 12, 2021, to initiate consultation with those parties previously identified for the undertaking. A list of the consulting parties to date for the RWF project is provided in EIS Appendix J. BOEM held an initial consultation meeting with consulting parties on December 17, 2021, to discuss the area of potential effects (APE) and the identification of historic properties within the APE. A second consultation meeting with consulting parties was held April 8, 2022, to discuss the identification of historic properties and potential effects on historic properties; and a third consultation meeting is anticipated in August or September 2022 to discuss adverse effects and their resolution. BOEM's final EIS will include treatment measures for resolving adverse effects to historic properties. An executed MOA among BOEM, the ACHP, SHPO(s), and the consulting parties will detail final resolution measures to resolve adverse effects, including avoidance, minimization, and mitigation measures.

EO 13007, Indian Sacred Sites, directs federal land management agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. BOEM management actions within the OCS may not directly affect Indian sacred sites; however, BOEM recognizes its undertakings could affect the physical integrity or ceremonial use of Indian sacred sites located on submerged federal lands on the OCS. As stated previously in the Government-to-Government Consultation with Federally Recognized Indian Tribes section, BOEM is also consulting with Indian tribes on these matters in accordance with EO 13175.

Magnuson-Stevens Fishery Conservation and Management Act

Pursuant to Section 305(b) of the MSA, federal agencies are required to consult with NMFS on any action that may result in adverse effects on EFH. NMFS regulations implementing the EFH provisions of the act can be found at 50 CFR 600. As provided for in 50 CFR 600.920(b), BOEM has accepted designation as the lead agency for the purposes of fulfilling EFH consultation obligations under Section 305(b) of the act. Certain OCS activities authorized by BOEM may result in adverse effects on EFH and therefore require consultation with NMFS. BOEM is developing a draft EFH assessment concurrent with this EIS. NMFS anticipates receipt of the complete EFH assessment from BOEM and initiation of the EFH consultation on November 1, 2022.

Development of Environmental Impact Statement

This section provides an overview of the development of the EIS, including public scoping, cooperating agency involvement, and distribution of the EIS for public review and comment.

Scoping

On April 30, 2021, BOEM issued an NOI to prepare an EIS consistent with the regulations implementing NEPA (42 USC 4321 et seq.) to assess the potential impacts of the Proposed Action and alternatives (BOEM 2021a). The NOI initiated a public scoping period from April 30 through June 1, 2021. During this time, input from federal agencies, tribes, state and local governments, and the general public was gathered regarding the potential of significant resources and issues, impact-producing factors, reasonable alternatives (e.g., size, geographic, seasonal, or other restrictions on construction and siting of facilities and activities), and potential mitigation measures to be analyzed in the EIS as well as provide additional information.

A correction to the NOI was issued by BOEM on June 4, 2021, which reopened the public scoping period (BOEM 2021b), allowing for comments to be received by June 11, 2021. The correction addressed and clarified two statements in the NOI regarding the energy capacity of the proposed wind farm and its distance from shore.[1]

BOEM accepted comment submissions on the NOI via the following mechanisms:

- Electronic submissions received via www.regulations.gov on docket number BOEM-2021-0029
- Hard copy comment letters submitted to BOEM via traditional mail
- Emails submitted to BOEM
- Hard copy comment cards and/or letters received during each of the public scoping meetings
- Comments submitted verbally during the listening sessions of each of the three virtual public scoping meetings

BOEM held three virtual public scoping meetings on May 13, May 18, and May 20, 2021. Each virtual public scoping meeting included a presentation, listening session, and a question and answer session, all available on BOEM's website at https://www.boem.gov/Revolution-Wind-Scoping-Virtual-Meetings.

Summary of Scoping Comments

BOEM reviewed and considered, as appropriate, all scoping comments in the development of the Draft EIS and used the comments to identify alternatives for analysis. The scoping summary report (SWCA Environmental Consultants n.d. [2021]) summarizing the 42 submissions received and the methods for analyzing them is available on BOEM's website at https://www.boem.gov/Revolution-Wind. In addition, all public scoping submissions received can be viewed online at http://www.regulations.gov by typing "BOEM-2021-0029" in the search field. As detailed in the scoping summary report, the resource areas or NEPA topics most referenced in the scoping comments include birds, marine mammals, effects analysis, socioeconomics, commercial fishing, mitigation, wildlife (general), bats, essential fish habitat and finfish, cumulative impacts, and sea turtles.

[1] Replaced the sentence "The project will deliver 704 MW of power to the New England energy grid." with "The project would have the capacity to deliver up to 880 MW of power to the New England energy grid, satisfying the current PPA total of 704 MW." Also replaced the sentence "The wind turbine generators, offshore substations, array cables, and substation interconnector cables would be located on the [Outer Continental Shelf] approximately 17.4 nautical miles (20 statute miles) south of the coast of Rhode Island." with "The wind turbine generators, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf (OCS) approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines."

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APPENDIX B

List of Preparers and Reviewers, References Cited, and Glossary

Contents

Tables

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LIST OF PREPARERS AND REVIEWERS

Table B-1. Bureau of Ocean Energy Management Contributors

Name	Role/Resource Area
National Environmental Policy Act (NEPA) Coordinator	
Olivier, Trevis	NEPA coordinator
Segarra, Katherine	NEPA coordinator
Resource Scientists and Contributors	
Baker, Arianna	Navigation and vessel traffic; military uses
Bedard, Justin	Cultural resources; government-to-government consultation
Bhandari, Doleswar	Socioeconomics
Bigger, David	Birds; bats; coastal habitats; terrestrial and coastal fauna; wetlands; USFWS Endangered Species Act (ESA) consultation
Caporaso, Alicia	Benthic resources
Carrier, Brandi	Project coordinator
Chaiken, Emma	Commercial fisheries and for-hire recreational fishing
Chaky, Sindey	Land use and coastal resources
Charpentier, Nicole	Coastal Zone management Act coordinator
Conrad, Alexander	Marine acoustics and sound exposure
Damour, Melanie	Navigation and vessel traffic; visual resources
de Zeeuw, Maureen	Birds; bats; coastal habitats
Glenn, Tre	Marine mammals; sea turtles; birds; bats; National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) ESA consultation
Heinze, Martin	Demographics, employment, and economics
Hesse, Jeffrey T.	Military uses
Howson, Ursula	NOAA NMFS essential fish habitat (EFH) consultation
Jensen, Mark	Demographics, employment, and economics
Johnson, Stacey	NEPA compliance
Jones, Douglas	Cultural resources; government-to government consultations
Lilley, Meredith	Project coordinator
Luton, Harry	Environmental justice; land use; recreation and tourism
McCarty, John	Recreation and tourism; visual resources
Merritt, Stacie	Air quality
Miller, Jennifer	Alternatives, geophysical, cable burial and routing
Morin, Michelle	Chief, Environment Branch for Renewable Energy; NEPA compliance

Name	Role/Resource Area
Nord, Beth	Marine mammals; sea turtles
Ren, Cholena	Air quality
Reuther, Dustin	Environmental justice, land use, recreation and tourism
Schiff, John	Water quality
Slayton, Ian	Cumulative impacts; air quality
Sorset, Scott	Cultural resources
Stokely, Sarah	Cultural resources; Section 106 consultations
Steen, Mariana	Benthic resources; invertebrates; finfish and essential fish habitat; NOAA NMFS EFH consultation
Stromberg, Jessica	Project coordinator
Sullivan, Kimberly	Environmental justice
Vaughn, Sarah	Water quality
White, Timothy	Birds; bats
Wisman, Jeri	Birds; bats; terrestrial and coastal fauna; wetlands; USFWS ESA consultation

Table B-2. Reviewers

Name	Title	Agency
Brown, William	Chief Environmental Officer	U.S. Bureau of Ocean Energy Management (BOEM)
Segarra, Katherine	NEPA Coordinator	U.S. Bureau of Ocean Energy Management
Olivier, Trevis	NEPA Coordinator	U.S. Bureau of Ocean Energy Management
Giordano, Juliette	Lead Environmental Protection Specialist	Bureau of Safety and Environmental Enforcement
Hildreth, Emily	Renewable Energy Policy Specialist	U.S. Bureau of Ocean Energy Management
Melendez-Arreaga, Pedro	Solicitor	U.S. Department of the Interior, Office of the Solicitor
Vorkoper, Stephen	Solicitor	U.S. Department of the Interior, Office of the Solicitor
Timmerman, Timothy	Director	U.S. Environmental Protection Agency Region 1, Office of Environmental Review
Engler, Lisa	Director	Massachusetts Office of Coastal Zone Management
Crocker, Julie	Endangered Fish Branch Chief, GARFO Protected Resources Division	National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS)

Name	Title	Agency
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Gray, Terry	Acting Director	Rhode Island Department of Environmental Management (RIDEM)
Amerault, Suzanne	Assistant to the Acting Director	RIDEM
Willis, Jeffrey	Acting Executive Director	Rhode Island Coastal Resource Management Council
Handell, Naomi	Project Manager, USACE, New York District Regulatory Branch-Eastern Section	U.S. Army Corps of Engineers (USACE)
Jacek, Christine	Project Manager, USACE New England District	USACE
Detweiler, George	Team Leader, Office of Navigation Standards	U.S. Coast Guard (USCG)
Desautels, Michele	District 1 Agency Point of Contact	USCG

Table B-3. Consultants

Name	Role/Resource Area
Project Management/Coordinators	
Fluder, Joseph; SWCA	Corporate sponsor
Hartmann, Christine; SWCA	Project manager; all sections
Wilmot, Susan; SWCA	Deputy project manager; all sections
Smith, Earl; SWCA	Geographic information systems
Diais, Madeline; SWCA	Administrative record
Subject Matter Experts	
Berger, Chris; Confluence Environmental Company, Inc. (Confluence)	Sea turtles
Bockey, Chris; SWCA	Visual
Bush, Diane; SWCA	Editor
Clapsaddle, Madison; SWCA	Appendices
Cziesla, Chris; Confluence	Marine mammals, sea turtles
Doyle, Eric, Confluence	Benthic resources; invertebrates; EFH/finfish; marine mammals; sea turtles; other (marine) uses; land use and coastal infrastructure
Faulkner, Geneva; Confluence	Land use and coastal infrastructure; other uses

Name	Role/Resource Area
Fisher, Michael; Northern Economics, Inc. (NEI)	Navigation and vessel traffic
Giblin, Kara; SWCA	Wetlands and WOTUS
Gilmer, Anna; SWCA	Cultural resources
Guest, Joanna; SWCA	Air quality
Hartley, Marcus; NEI	Commercial fisheries and for-hire recreational fishing; Demographics, employment, and economics
Himmelstein, Ashley; Christopher Goodwin & Associates (RCGA)	Cultural resources marine archaeology
Hogel, Adrian; SWCA	Bats; birds; coastal habitats and fauna; wetlands and WOTUS
Klewicki, Laura; SWCA	Water quality
Linehan. Kerri; SWCA	Editor
Maymon, Jeffrey; RCGA	Cultural resources—marine archaeology
McDonald, Kelly; Confluence	Benthic resources; invertebrates
Novak, Grant; Confluence	Benthic resources; invertebrates; EFH/finfish; marine mammals; sea turtles; other (marine) uses; land use and coastal infrastructure
Phillips, Scott; SWCA	Cultural resources—terrestrial resources, terrestrial archaeology, historic architecture, viewshed resources; tribal consultation
Sato, Irene; Confluence	EFH/finfish
Schug, Donald; NEI	Demographics, employment, and economics; environmental justice
Smith, Debbi; SWCA	Formatter and 508 specialist
Sohm, Brad; SWCA	Air quality
Soncarty, Chris; Confluence	Marine mammals; sea turtles; biological assessments; EFH/finfish
Tucker Burfitt, Linda; SWCA	Editor
Wilmot, Sue; SWCA	Recreation and tourism; water quality
Witzens, Kelcie; SWCA	Formatter and 508 specialist

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GLOSSARY

Term	Definition
affected environment	Environment as it exists today that could be impacted by the proposed Project
ancient submerged landform feature	A landform as it was in ancient times
algal blooms	Rapid growth of the population of algae, also known as algae bloom
allision	A moving ship running into a stationary ship
anthropogenic	Generated by human activity
applicant	Revolution Wind, LLC
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
cofferdam	A watertight enclosure pumped dry to permit construction work below the waterline
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
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 threated or endangered species. This is a specific term and designation within the U.S. Endangered Species Act.

Term	Definition
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
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)
environmental protection measure (EPM)	Measure proposed in a COP to avoid or minimize potential impacts
electromagnetic field	A field of force produced by electrically charged objects and containing both electric and magnetic components
endangered species	A species that is in danger of extinction in all or a significant portion of its range
Endangered Species Act–listed species	Species listed under the Endangered Species Act
ensonified	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
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
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

Term	Definition
foundation	The bases to which the wind turbine generators and offshore substation are installed on the seabed. Five alternative foundation designs were considered and reviewed for the Project (Section 2.2.2.2 of the COP): monopile; piled three-, four-, or six-legged jacket; suction caisson jackets; monopod suction caisson; or gravity-based structure. Monopile is the selected foundation type for the Project.
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
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
inter-array cables	Cables connecting the wind turbine generators to the offshore substations
interconnection facility	Substation connecting the proposed Project to the existing bulk power grid system
invertebrate	Animal with no backbone
jack-up vessel	Mobile and self-elevating platform with buoyant hull
jet plow	Method of submarine cable installation equipment that primarily uses water jets to fluidize soil, temporarily opening a channel to enable the cable to be lowered under its own weight or be pushed to the bottom of the trench via a cable depressor.
knot	Unit of speed equaling 1 nautical mile per hour
landing site	The shoreline landing site at which the offshore cable transitions to onshore
Lease Area	The entire area that Revolution Wind, LLC purchased from BOEM. The RWF must be within the Lease Area.
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
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

Term	Definition
National Ambient Air Quality Standards	Limits on atmospheric concentration of six criteria pollutants that are common in outdoor air and considered harmful to public health and the environment as established by the U.S. Environmental Protection Agency under authority of the Clean Air Act.
nautical mile	A unit used to measure sea distances and equivalent to approximately 1.15 miles
offshore Revolution Wind Export Cable	Export cables located in state or federal waters
offshore substation	The interconnection point between the wind turbine generators and the export cable; the necessary electrical equipment needed to connect the inter-array cables to the offshore export cables
onshore transmission cable	Export cables located on land
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
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 Revolution Wind Farm and the Revolution Wind Export Cable
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 or government land that allows access by another entity. For purposes of renewable energy development of the Outer Continental Shelf (OCS), BOEM defines a right-of-way grant as an authorization issued by BOEM under 30 CFR 585 Subpart B to use a portion of the OCS for the construction and use of a cable or pipeline for the purpose of gathering, transmitting, distributing, or otherwise transporting electricity or other energy product generated or produced from renewable energy but does not constitute a project easement under Subpart B. The term also means the area covered by the authorization.
ruderal	Growing on waste ground or among refuse
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
sessile	Attached directly by the base

Term	Definition
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
Revolution Wind Farm (RWF)	The work area containing all proposed wind turbine generators, offshore substations, and inter-array cables
substrate	Earthy material at the bottom of a marine habitat; the natural environment that an organism lives in
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
transition vault	Underground concrete transition vault that to be constructed at the landing site and inside of which offshore and shore South Fork 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
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

APPENDIX C

Incomplete or Unavailable Information

Contents

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Introduction

In accordance with Section 1502.21[1] of the Council on Environmental Quality regulations implementing the National Environmental Policy Act (NEPA), when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement (EIS) and there is incomplete or unavailable information, the agency shall make clear that such information is lacking.

Given the substantial geographic and temporal scale of the cumulative impacts analysis for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (Project), some information regarding ongoing activities is unavailable or only available in qualitative or summary form—in particular, for many offshore resources. Concerning reasonably foreseeable construction and operations plans (COPs), specific information is available only for COPs that have been submitted for Bureau of Ocean Energy Management (BOEM) review and are publicly available (see Appendix E of the EIS). Given that information is lacking for other offshore wind activities considered reasonably foreseeable, and several of the COPs submitted are currently under review to determine whether they contain complete and sufficient information for environmental review, a series of assumptions were necessary to conduct the cumulative impacts analysis as outlined in Appendix E3, Table E3-1. Although these assumptions were necessary to allow the analysis to proceed with a reasonable degree of certainty, it is not known whether or to what extent future offshore wind activities will proceed according to these assumptions.

In addition to the uncertainty regarding future activities contemplated in the cumulative analysis, there is also incomplete or unavailable information regarding the likely consequences of various activities on the resources analyzed. When incomplete or unavailable information was identified, BOEM considered whether the information was relevant to the assessment of impacts and essential to a reasoned choice among alternatives. If essential to a reasoned choice among the alternatives, BOEM considered whether it was possible to obtain the information and if the cost of obtaining it was unreasonable. If information could not be obtained within the time frame needed for this analysis or because of exorbitant costs, BOEM applied acceptable scientific methodologies to inform the analysis in light of this incomplete or unavailable information. For example, conclusive information on many impacts of the offshore wind industry may not be available for years and would therefore not be available within the contemplated time frame of this NEPA process. In its place, subject matter experts have used the scientifically credible information available and accepted scientific methodologies for proxy indicators or data to evaluate impacts on the resources while this information is unavailable.

Incomplete or Unavailable Information Analysis for Resource Areas

Air Quality

Any action alternative for the Project would lead to air quality impacts that range from **negligible** to **moderate** and **minor** beneficial. Although a quantitative emissions inventory analysis of the region over the next 35 years has not been completed, the EIS does disclose annual emissions that could have been avoided by using non–fossil fuel energy sources within the air quality geographic analysis area, as well as the health impacts from those avoided emissions. In addition, the differences among action alternatives

[1] 40 CFR 1502.22 in Council on Environmental Quality regulations implementing NEPA prior to September 14, 2020.

with respect to direct emissions due to construction and installation, operations and maintenance (O&M), and decommissioning of the Project would likely be small. For this reason, the analysis provided in the EIS is sufficient to support sound scientific judgements and informed decision making related to the use of onshore and offshore portions of the air quality geographic analysis area. In summary, BOEM did not identify incomplete or unavailable information on air quality that is essential to a reasoned choice among alternatives.

Bats

Habitat use and distribution vary between season and species, and as a result, there will always be some level of incomplete information on the distribution and habitat use of migratory bats in the offshore portions of the bat geographic analysis area. In addition, because U.S. offshore wind is in its infancy, with three offshore wind projects (Block Island Wind Farm, Virginia Commercial Offshore Wind, and Vineyard Wind Farm) having been or currently being constructed at the time of this analysis, there is some level of uncertainty regarding the potential collision risk to individual bats that may be present within the offshore portions of the geographic analysis area. However, empirical data, including regional bat acoustic studies conducted from coastal, island, vessel, or offshore structure locations and regional telemetry data from recent studies focusing on listed species, were used to assess the likelihood of offshore occurrence, seasonal patterns, and bat species composition.

Information on collision risk to migratory bats is also available from observations collected at land-based U.S. wind facilities, and based on a number of assumptions regarding the applicability to offshore environments, this information was used to analyze and evaluate the potential for collisions associated with the wind turbine generators (WTGs) analyzed in the EIS. In addition, and as described in Section 3.5.1 of the EIS, the likelihood of an individual migratory bat encountering the rotor swept zone of one or more operating WTGs is negligible. For this reason, the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the distribution and use of the offshore portions of the geographic analysis area, as well as to the potential for collision risk of migratory bats. Further, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM did not identify incomplete or unavailable scientifically based information on bat resources that is essential to a reasoned choice among alternatives.

Benthic Habitat and Invertebrates

Although there is some uncertainty regarding the temporal distribution of benthic resources and periods during which they might be especially vulnerable to disturbance, site-specific benthic habitat mapping by Inspire Environmental (2020) and other broadscale studies (e.g., Fugro 2019, 2021; Guida et al. 2017; Stantec 2020) provided a suitable basis for predicting the species, community composition, and distributions of benthic resources in the geographic analysis area. Some uncertainty also exists about the effects of some impact-producing factors (IPFs) on benthic resources. For example, the available information on invertebrate sensitivity to electromagnetic fields (EMFs) is equivocal (Hutchinson et al. 2020), and sensitivity to sound pressure and particle motion effects is not well understood for all species (e.g., squid sensitivity to vibration effects transmitted through sediments). However, information from monitoring studies of European wind facilities and, more recently, the Block Island Wind Farm in the United States provides no indication of biologically significant adverse effects. There is broader uncertainty about the long-term effects of changes in biological productivity resulting from the creation of new habitat types on the mid-Atlantic Outer Continental Shelf (OCS) in the form of a distributed network of artificial reefs. The widespread development of offshore renewable energy facilities would, however, create a distributed network of artificial reefs on the mid-Atlantic OCS. These reefs form biological hotspots that could support species range shifts and expansions, nonnative species, and changes in biological community structure (Degraer et al. 2020; Methratta and Dardick 2019; Raoux et al. 2017). The nature and significance of secondary synergistic effects, such as changes in diet and predator-prey interactions resulting from habitat modification in combination with other IPFs, are not fully known. Lastly, the nature, extent, and significance of potential spillover effects on broader ecosystem functions, such as larval dispersal, are not fully understood (van Berkel et al. 2020).

As stated, ongoing monitoring studies at European wind facilities and the Block Island Wind Farm in the United States provide a useful basis for evaluating the combined effects of these IPFs on the biological community as a whole, even if effects on individual species cannot be predicted with specificity. On balance, the current scientific information is sufficient to support sound scientific judgements and informed decision making because relevant studies monitoring changes at wind farms have not observed significant changes to finfish over years of study. Further, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM did not identify incomplete or unavailable information that is essential to a reasoned choice among alternatives. There is uncertainty regarding the spatial and temporal occurrence of invertebrates throughout the entire benthic habitat and invertebrates geographic analysis area. However, broadscale information is available from sources such as federal fisheries management plans (FMPs) and surveys completed to support COP submission. There is also uncertainty regarding behavioral effects from each IPF individually and cumulatively. Again, BOEM is able to draw on existing scientific findings, as presented in Section 3.6 of the EIS and references therein. The available information is suitable for characterizing the likely effects of each IPF and has been used to analyze potential impacts resulting from the proposed Project and past, present, and reasonably foreseeable actions. Therefore, BOEM concludes that the available information about potential impacts on benthic habitats supports a reasoned choice among alternatives.

Birds

Habitat use and distribution of birds vary between seasons, species, and years, and as a result, there will always be some level of incomplete information on the distribution and habitat use of birds in the offshore portions of the birds geographic analysis area. However, survey findings for the Project (see COP Appendix K [*Onshore Natural Resources and Biological Assessment*] [vhb 2021]) were used to inform the predictive models and analyze the potential adverse impacts on bird resources in the EIS. In addition, because U.S. offshore wind is in its infancy, as described above for bats, there will always be some level of uncertainty regarding the potential for collision risk and avoidance behaviors for some of the bird species that may be present within the offshore portions of the geographic analysis area.

Bird mortality data are available for onshore wind facilities, and based on a number of assumptions (described in Section 3.7 of the EIS) regarding their applicability to offshore environments, these data were used to inform the analysis of bird mortality associated with the offshore WTGs analyzed in the EIS. However, uncertainties exist regarding the use of the onshore bird mortality rate to estimate offshore bird mortality rate because of differences in species groups present, the life history and behavior of species, and the differences in the offshore marine environment compared to onshore habitats. Similarly, the U.S. Fish and Wildlife Service biological assessment (BA) (BOEM 2022a) also provides an estimate of potential mortality using the Band (2012) collision risk model for Endangered Species Act species. Modeling is commonly used to predict the potential mortality rates for marine bird species in Europe and the United States (BOEM 2015, 2022a). Because of inherent data limitations, these models often represent only a subset of species potentially present. However, the datasets used by both Revolution Wind, LLC (Revolution Wind), and BOEM to assess the potential for exposure of birds to offshore wind activities represent the best available data and provide context at both local and regional scales. Further, sufficient information on collision risk and avoidance behaviors observed in related species at European offshore wind projects is available and was used to analyze and corroborate the potential for these impacts as a result of the Project (e.g., Petersen et al. 2006; Skov et al. 2018). For this reason, the analysis provided in the EIS is sufficient to support sound scientific judgements and informed decision making related to distribution and use of the offshore portions of the analysis area, as well as to the potential for collision risk and avoidance behaviors in bird resources. Further, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM did not identify incomplete or unavailable information on bird resources that is essential to a reasoned choice among alternatives.

Coastal Habitats and Fauna

Although the preferred areas of coastal habitats and associated fauna are generally known, exact abundances and distributions of various fauna are likely to remain unknown for the foreseeable future. However, the species inventories and other information from nearby areas provide an adequate basis for evaluating the fauna likely to inhabit the coastal habitat and fauna geographic analysis area. Additionally, the onshore activities proposed involve only common, industry-standard activities for which impacts are generally understood. For this reason, BOEM identified no incomplete or unavailable information required to conduct the impact assessment or to make a reasoned choice among alternatives.

Commercial Fisheries and For-Hire Recreational Fishing

Fisheries are managed in the context of an incomplete understanding of fish stock dynamics and effects of environmental factors on fish populations. The fisheries information used in this assessment has limitations. For example, vessel trip report data are only an approximation because they are self-reported, and available historical data lack consistency, making comparisons challenging. However, these data do represent the best available data, and sufficient information exists to support the findings presented herein.

A second limitation is that aggregated geographic information system (GIS)–based data is necessary to fully update the revenue intensity figures. EIS Figures G-1 through G-13 in Appendix G provide low-resolution images of revenue intensity by FMP and provide graphic representations of the distribution of fishing efforts near the Lease Area for the years shown. However, similar revenue intensity figures are not available for ports or gear. Although the analysis in EIS Section 3.9 refers to these figures, annual vessel trip report data for 2008 to 2019 from the Greater Atlantic Regional Fisheries Office (GARFO) (2021) were the primary sources of data used in the tables throughout the assessment. These tables in EIS Section 3.9 summarize harvests and revenues by FMP, by ports, and by gears within the RWF and Revolution Wind Export Cable. Although additional revenue intensity figures would augment information provided in the analysis, BOEM determined this information is not essential to a reasoned choice among alternatives.

Cultural Resources

Information pertaining to the identification of historic properties within certain portions of the marine archaeology area of potential effects will not be available until after the record of decision (ROD) is issued and the COP is approved. BOEM will prepare a ROD in consultation with the National Historic Preservation Act Section 106 consulting parties that will allow for deferred identification and evaluation of historic properties within the marine archaeology area of potential effects, facilitating that a good faith effort to identify historic properties and assess effects is fully performed prior to construction. The ROD will apply to the alternative(s) selected. Therefore, BOEM has not identified incomplete or unavailable information on cultural resources that is essential to a reasoned choice among alternatives.

Demographics, Employment, and Economics

Estimates of local employment and income resulting from development and construction of the Project may be underestimated because the broadly used model to project the employment impacts of offshore wind energy development—the Jobs and Economic Development Impact Offshore Wind Model (JEDI-OWM) developed by the National Renewable Energy Laboratory (NREL)—has not been updated to include recent developments within the U.S. offshore wind component manufacturing and fabrication industry, despite NREL's recent updates to capital cost estimation portions of the JEDI-OWM.[2]

The COP and COP appendices do provide estimates of a capital and operating cost of a single configuration of RWF (with 89 8-megawatt [MW] WTGs and a nameplate capacity of 712 MW) along with an estimate of economic impacts to the United States and local economies of Rhode Island and Connecticut based on the 2017 version of the JEDI-OWM. It is presumed that Revolution Wind provided specific guidance to their economic analysts with respect to technical and cost parameters, as well as United States and local spending coefficients for this assessment. However, most of the specific technical details of the assessment were not provided to BOEM or to the authors of the EIS. Therefore, estimates of economic impacts of the development and construction of RWF under the range of EIS alternatives rely heavily on the economic impacts developed in the COP relative to estimates of capital and operating costs of the single configuration provided.

Because Revolution Wind provided the baseline estimates of economic impacts of the Project, and because other information from NREL's updated JEDI-OWM model[2] provides current estimates of capital costs of offshore wind farms with WTGs ranging up to 15 MW, BOEM determined that the lack of directly provided information with respect to other configurations is not essential to a reasoned choice among alternatives.

[2] An updated version of JEDI-OWM was made available in 2021. The portions of the JEDI-OWM used to estimate capital operational costs have been updated and include cost estimates of large WTGs (12 MW and 15 MW) that are likely to be employed in future offshore windfarms. However, sections of the model that are used to estimate U.S. and local economic impacts have not yet been completed. The economic impact estimates used in the demographic, employment, and economics section of the EIS are augmented by improved capital cost estimates in the new release, but continue to employ U.S. and local spending patterns included in the 2017 version of the JEDI-OWM.

Environmental Justice

Evaluations of impacts on environmental justice communities rely on the assessment of impacts on other resources. As a result, incomplete or unavailable information related to other resources, as described in this document, also affect the completeness of the analysis of impacts on environmental justice communities. However, BOEM has determined that the incomplete and unavailable resource information summarized in this appendix was either not relevant to a reasoned choice among alternatives or the alternative data or methods used to predict potential impacts provided the best available information. Therefore, the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the proposed uses of the onshore and offshore portions of the environmental justice analysis area.

Finfish and Essential Fish Habitat

Monitoring studies of European and American offshore wind energy facilities to date (Hutchison et al. 2020; Raoux et al. 2017; Reubens et al. 2013, 2014) provide no indication of biologically significant adverse effects on finfish and their habitats. However, broader uncertainty remains about the long-term effects of changes in biological productivity resulting from the creation of new habitat types along the Atlantic OCS in the form of a distributed network of artificial reefs (Degraer et al. 2020). The nature and significance of potential ecological responses, such as changes in diet and predator-prey interactions resulting from changes in habitat productivity, are not fully known. Lastly, the nature, extent, and significance of potential spillover effects on broader ecosystem functions, such as seasonal stratification of the Cold Pool and larval dispersal patterns, are not fully understood (Johnson et al. 2021; van Berkel et al. 2020). Targeted modeling studies suggest that the effects of offshore wind development in the RI/MA and MA WEAs on water column stratification and larval dispersal patterns are unlikely to be ecologically significant (Johnson et al. 2021). However, this study considered only two out of several WEAs in the geographic analysis area, meaning that the potential effects resulting from full build-out of all WEAs within the geographic analysis area remain to be studied.

As stated, ongoing monitoring studies at European wind facilities and the Block Island Wind Farm in the United States provide a useful basis for evaluating the combined effects of these IPFs on the biological community as a whole, even if effects on individual species cannot be predicted with specificity. On balance, the current scientific information is sufficient to support sound scientific judgements and informed decision making because relevant studies monitoring changes at wind farms have not observed significant changes in finfish abundance and distribution at regional scales over years of study. For example, while wind farm installation can displace soft-bottomed habitat in favor of hard substrates, the affected areas usually represent a small fraction of available habitat. Moreover, offshore wind structures provide habitat complexity that generally results in an increase in biological productivity, which in turn can attract fish species that associate with complex habitat types (Degraer et al. 2020). Therefore, while some uncertainty remains, the available information does not suggest that long-term negative effects are likely. The similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives.

There is uncertainty regarding the spatial and temporal occurrence of finfish and essential fish habitat (EFH) throughout the entire finfish and EFH geographic analysis area. This is especially true for Atlantic cod (*Gadus morhua*) use of the Coxes Ledge area, which is part of an ongoing study funded by BOEM examining the movements of commercial fish species in southern New England (National Oceanic and Atmospheric Administration [NOAA] 2020a). However, broadscale information is available from sources such as federal FMPs and from surveys completed to support COP submission. There is also uncertainty regarding behavioral effects from each IPF individually and cumulatively (e.g., operational noise effects on Atlantic cod communication during spawning). Again, BOEM is able to draw on existing scientific findings, as presented in Section 3.13 of the EIS and references therein, in the RWF EFH assessment (BOEM 2022c), and in the National Marine Fisheries Service (NMFS) BA (BOEM 2022b). The available information is suitable for characterizing the likely effects of each IPF and has been used to analyze potential impacts resulting from the Project and past, present, and reasonably foreseeable actions. For this reason, the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the proposed uses of the offshore portions of the geographic analysis area. Further, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM concluded that the available information about potential impacts on finfish and EFH supports a reasoned choice among alternatives.

Land Use and Coastal Infrastructure

There is no incomplete or unavailable information related to the analysis of impacts on land use and coastal infrastructure.

Marine Mammals

Although there is some uncertainty regarding the temporal distribution of marine mammals and periods during which they might be especially vulnerable to Project disturbance, the NMFS BA (BOEM 2022b) provides detailed species descriptions and life history information. NOAA has summarized the most current information about marine mammal population status, occurrence, and use of the region in their 2019 and 2020 stock status reports for the Atlantic OCS and Gulf of Mexico (Hayes et al. 2020, 2021). These studies provide a suitable basis for predicting the species, abundances, and distributions of marine mammals in the geographic analysis area.

Uncertainty also exists with regard to the effects of some IPFs on marine mammals. For example, there is still some uncertainty regarding the impacts on marine mammals from EMF produced by submarine cables. This uncertainty is due in part to difficulties in evaluating population-scale impacts around regional deployments (Taormina et al. 2018), to the large size and high mobility of marine mammals, and to other logistical constraints, which make experimental studies infeasible. As a result, no scientific studies have been conducted to examine the effects of altered EMF on marine mammals. Although scientific studies summarized by Normandeau Associates, Inc., et al. (2011) demonstrate that marine mammals are sensitive to and can detect small changes in magnetic fields, as described in Section 3.15 of the EIS, those potentially detectable impacts would only occur within a few feet of select cable segments. There is no basis to conclude that the potential detection of EMFs would lead to any measurable change in behavior. For this reason, the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the proposed uses of the offshore portions of the geographic analysis area.

Some uncertainty also exists regarding the cumulative acoustic impacts associated with pile-driving activities. The available information relative to impacts on marine mammals from pile driving associated with offshore wind development is primarily limited to information on harbor porpoise (*Phocoena phocoena*) and harbor seal (*Phoca vitulina*) because most of this research has occurred at European offshore wind projects, where large whales are uncommon. At this time, it is unclear if marine mammals would cease feeding and when individuals would resume normal feeding, migrating, breeding, etc., behaviors once daily pile-driving activities cease, or if secondary indirect impacts would persist. Under the cumulative impact scenario, individual whales may be exposed to acoustic impacts from multiple projects in 1 day or to acoustic impacts from one or more projects over multiple days. The consequences of these exposure scenarios have been analyzed with the best available information, but a lack of real-world observations on species' responses to pile-driving results is uncertain. Additionally, it is currently unclear how sequential years of construction of multiple projects would impact marine mammals. Future projects will undergo a project-specific analysis under NEPA, the Endangered Species Act, and the Marine Mammal Protection Act that may reach different impact conclusions from this analysis if warranted based on new scientific and potentially observable information, or if impacts are defined differently from the EIS.

There is also uncertainty about certain potential impacts on marine mammals resulting from the long-term presence of offshore wind structures in the environment. For example, operational WTGs would generate low-frequency underwater noise that may exceed the established minimum threshold for potential behavioral and auditory masking impacts within a short distance (e.g., approximately 120 feet) from each foundation, although detectable noise above ambient levels could extend up to 560 feet or more. These structures would contribute to and potentially increase ambient noise within each WEA, albeit at levels generally not associated with adverse effects on marine mammals. However, the 120 root mean square decibels (dB_{RMS}) threshold may not adequately represent the potential for adverse effects of chronic noise exposure (e.g., Cholewiak et al. 2018; Hatch et al. 2012; Jensen et al. 2009; Putland et al. 2017). The implications of long-term operational noise impacts and structure presence on marine mammal behavior, particularly the behavior of large whale species, are unclear. These potential impacts are topics of ongoing research.

There is broader uncertainty about how large whales will respond to the presence of extensive networks of novel offshore wind structures on the Atlantic OCS. Under the cumulative impact scenario, up to 3,110 new structures (i.e., WTGs and OSSs) could be constructed across the geographic analysis area. Although the planned spacing of structures would not obstruct whale movement between structures, the potential synergistic effects of structure presence and low-level operational noise are uncertain. There is also some uncertainty around reef effect and hydrodynamic impacts on prey and forage availability and predator-prey interactions. Additionally, these impacts could combine and interact with ongoing changes in marine species distribution and community composition driven by climate change. Displacement effects that result in increased interactions between vulnerable populations of marine mammals and commercial shipping and/or fishing activity could have significant long-term cumulative effects. The potential consequences of these impacts on the Atlantic OCS are unknown. Monitoring studies could be able to track these changes and observe how they may influence whale behavior. At present, BOEM has no basis to conclude that these IPFs would result in significant adverse impacts on any marine mammal species.

At present, currently available information suggests that hydrodynamic effects of foundation structures are likely to be localized and not additive when spaced at 1 nm in environments with strong seasonal stratification (van Berkel et al. 2020). Recent modeling of hydrodynamic effects suggests that surface currents could be affected by the presence of multiple wind farms potentially impacting the distribution of larvae (Johnson et al. 2021). There is insufficient information to determine if this conclusion is valid for broader scale development at the levels planned within the geographic analysis area.

BOEM determined that the overall costs of obtaining the missing information for or addressing uncertainty of the above topics for marine mammals are exorbitant or that the means to obtain it are not known. Therefore, BOEM extrapolated or drew assumptions from known information for similar species and/or situations, as presented in Section 3.15 of the EIS and in the BA submitted to NMFS (BOEM 2022b). As a result, the information and methods used to predict potential impacts on marine mammals represent the best available information, and the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the proposed uses of the offshore portions of the geographic analysis area. Notwithstanding the foregoing, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM has not identified incomplete or unavailable scientific information on marine mammal resources that is essential to a reasoned choice among alternatives.

Navigation and Vessel Traffic

The navigation and vessel traffic impact analysis in the EIS is based on automatic identification system (AIS) data for calendar year 2019. Vessel monitoring system (VMS) data for fishing vessels provided by the NMFS were the basis for polar histograms and other analytical outputs used in evaluating commercial and for-hire recreational fishing trips (see EIS Section 3.9). Some smaller recreational and fishing vessels carry an AIS; however, the AIS analysis likely excludes most vessels less than 65 feet (19.8 meters) long that traverse the WEA. In addition, as discussed under Commercial Fisheries and For-Hire Recreational Fishing, above, the VMS data provided by NMFS indicate the number of vessels in each fishery and their direction of travel while actively fishing, which speaks to alignment of the WTG grid. Nonetheless, the combination of AIS and VMS data described above represent the best available vessel traffic data and are sufficient to enable BOEM to make a reasoned choice among alternatives.

The U.S. Coast Guard’s (USCG’s) final report for the Areas Offshore of Massachusetts and Rhode Island Port Access Route Study (MARIPARS), evaluating the need for establishing vessel routing measures, was published in the *Federal Register* on May 27, 2020 (USCG 2020). The MARIPARS report recommends a standard and uniform grid pattern turbine layout throughout the Rhode Island and Massachusetts Lease Areas as the best way to facilitate predictable safe navigation throughout the contiguous leases. The five Rhode Island and Massachusetts offshore wind leaseholders, including Revolution Wind, have proposed a collaborative regional layout for wind turbines (1 × 1 nm apart in fixed east–west rows and north–south columns, with 0.7-nm theoretical transit lanes oriented northwest–southeast) across their respective BOEM leases (Geijerstam et al. 2019), which meets the layout rules set forth in the MARIPARS report recommendations. Although the USCG attached to the MARIPARS *Federal Register* docket the Responsible Offshore Development Alliance proposal (Hawkins 2020), which recommends additional transit corridors through the Lease Areas, the MARIPARS report concludes that if the layout in the recommendations was implemented, the USCG would likely not pursue additional formal or informal routing measures. As a cooperating agency with BOEM, the USCG would continue to consult over the course of the NEPA process for the Project as it relates to navigational safety and other aspects, including the impacts associated with alternatives assessed. Therefore, BOEM has not identified incomplete or unavailable information on navigation and vessel traffic that is essential to a reasoned choice among alternatives.

Other Uses

In the context of this EIS, other uses includes aviation and air traffic, land-based radar, marine mineral resources and dredged material disposal, military and national security, offshore energy (aside from the proposed Project), scientific research and surveys, and undersea cables. There is no incomplete or unavailable information related to the analysis of marine mineral resources and dredged material disposal, military and national security, aviation and air traffic, offshore energy (aside from the aspects described in this appendix for the proposed Project, and the reasonably foreseeable offshore wind projects for which BOEM has not received COPs), undersea cables, and land-based radar uses.

As discussed in Section 3.17 of the EIS for scientific research and surveys, analysis in the EIS discloses both Project-specific and cumulative impacts to NMFS's ability to continue conducting scientific research and surveys for the purpose of fisheries management and protected species management. Despite the foregoing, BOEM has concluded that the information provided by NOAA in Section 3.17 regarding scientific research and surveys is sufficient to support the impact findings presented in the EIS. Therefore, BOEM has not identified incomplete or unavailable information on scientific research and surveys that is essential to a reasoned choice among alternatives.

Recreation and Tourism

There is a lack of quantitative data related to recreational not-for-hire fishing in the recreation and tourism geographic analysis area; therefore, quantitative analysis for this resource is not possible at this time. BOEM is considering how best to approach this issue for future similar projects. *Fisheries Economics of the United States 2018* (NMFS 2021) is a comprehensive summary document and the data presented discuss the overall economic level for not-for-hire recreational anglers in the offshore New England region (Maine, New Hampshire, Rhode Island, Connecticut, and Massachusetts). However, the document does not relate to how projects such as the RWF are likely to affect not-for-hire recreational fishing and is not detailed enough in geographic extent to discuss specific recreational angling locations.

However, BOEM has determined that incomplete and unavailable resource information was either not relevant to a reasoned choice among alternatives or alternative data or methods used to predict potential impacts provided the best available information. Therefore, the analysis provided in the EIS is sufficient to support sound scientific judgments and informed decision making related to the proposed uses of the onshore and offshore portions of the geographic analysis area.

Sea Turtles

Sea turtles are difficult to observe in the open ocean, and there is some uncertainty about the distribution of some turtle species (e.g., the green sea turtle [*Chelonia mydas*]) in relation to the Lease Area. The NMFS BA (BOEM 2022b) provides a thorough overview of the available information about potential species occurrence and exposure to Project-related IPFs. The studies summarized therein provide a suitable basis for predicting potential species occurrence, relative abundance, and probable distribution of sea turtles in the geographic analysis area.

Some uncertainty exists about the effects of certain IPFs on sea turtles and their habitats. For example, sea turtle sensitivity to potential EMF effects from the Project is not fully understood. Sea turtles are known to use the earth's magnetic field to orient in space and navigate between habitats (Irwin and Lohmann 2005; Courtillot et al. 1997). However, the available research has not examined how sea turtles respond to lower strength EMF levels on the order of those likely to result from the Project. Although there are no direct data on impacts on sea turtles from EMFs generated by underwater cables, the preponderance of evidence summarized in the BOEM-sponsored report by Normandeau et al. (2011) indicates that sea turtles are unlikely to detect most of the EMF impacts resulting from the Project. Potentially detectable EMF effects would be limited to within 5 feet of the short segments of cable laid on the seafloor that are not buried. Section 3.19 of the EIS and the NMFS BA (BOEM 2022b) allowed BOEM's subject matter experts to estimate the potential risk to other species of sea turtles based on the assumption of similar anatomical, behavioral, and life history similarities, related to EMFs. Although the thresholds for EMF disturbance to the behavior of all potential species of sea turtles are not known, no adverse effects on sea turtles from the numerous submarine power cables around the world have been documented, and modeling of the anticipated EMFs generated by Project components suggests the majority of induced field strengths would likely be below detection levels. Similar to marine mammals, data are also not available to evaluate potential changes to normal movements of juvenile and adult sea turtles due to short-term elevated suspended sediments. Although some exposure may occur, total suspended sediment impacts would be limited in magnitude and duration and within the range of natural exposures periodically experienced by these species. On this basis, any resulting impact on behavior would likely be too small to be biologically meaningful, and no adverse impacts would be expected (NOAA 2020b).

There is also uncertainty relative to sea turtle responses to construction activities on the Atlantic OCS. Some potential for displacement from areas exposed to noise and disturbance exists. However, should any displacement of individuals occur, it is unclear if this would result in adverse impacts (e.g., because of lost foraging opportunities or increased exposure to potentially fatal vessel interactions). Additionally, it is currently unclear whether concurrent construction of multiple projects, increasing the extent and intensity of impacts over a shorter duration or spreading out project construction, and associated impacts over multiple years would result in the least potential harm to sea turtles. There is also uncertainty regarding the cumulative acoustic impacts associated with pile-driving activities. At this time, it is unclear if sea turtles that have ceased feeding during multiple construction activities would resume normal feeding, migrating, breeding, etc., behaviors once daily pile-driving activities cease or if secondary indirect impacts would continue. Under the cumulative impact scenario, individual sea turtles may be exposed to acoustic impacts from multiple projects in 1 day or to acoustic impacts from one or more projects over the course of multiple days. The consequences of these exposure scenarios have been analyzed with the best available scientific information in Section 3.19 of the EIS, although some level of uncertainty remains due to the lack of observational data on species responses to pile driving. In addition, modeled predictions of operational sound for large turbines (10 MW) indicate that the sound levels could be greater than observed for existing wind turbines; actual sound levels are still predicted to be well below levels that could potentially cause harm.

Some uncertainty exists in regard to the potential for sea turtle responses to Federal Aviation Administration hazard lights and navigation lighting associated with offshore wind development. Given the placement of the new structures far from nesting beaches and within the OCS, no impacts to nesting female or hatchling sea turtles would be expected. Revolution Wind has incorporated BOEM's guidance

(BOEM 2021; Orr et al. 2013) for avoiding and minimizing artificial lighting impacts on aquatic life into the Project design. This environmental protection measure would limit WTG and electrical service platform lighting to minimum levels required by regulation for worker safety, navigation, and aviation. Sea turtle sensitivity to these minimal light levels is unknown. However, given that sea turtles do not appear to be adversely affected by oil and gas platform operations, which produce far more artificial light than offshore wind structures (BOEM 2022b), this IPF is not expected to have any measurable impacts (adverse or beneficial) on sea turtles in the offshore environment.

More broadly, considerable uncertainty remains about how sea turtles would interact with the long-term changes in biological productivity and community structure resulting from the development of an extensive network of artificial reefs across the geographic analysis area. Artificial reef and hydrodynamic impacts could influence predator-prey interactions and foraging opportunities in ways that influence sea turtle behavior and distribution. These IPFs are expected to interact with the ongoing influence of climate change on species distribution and behavior over broad spatial scales, but the nature and significance of these interactions are unclear. BOEM anticipates that ongoing monitoring of offshore energy structures will provide some useful insights into these synergistic effects. BOEM considered the level of effort required to address the uncertainties described above for sea turtles and determined that the methods necessary to do so are lacking and/or the associated costs would be exorbitant. Where appropriate, BOEM inferred conclusions about the likelihood of potential biologically significant impacts from available information for similar species and/or situations. These methods are described in greater detail in Section 3.19 of the EIS and in the BA submitted to NMFS (BOEM 2022b). The approaches and methods used are based on the best available scientific information, and the analysis provided in the EIS is sufficient to support sound scientific judgements and informed decision making related to the proposed uses of the offshore portions of the analysis area. Notwithstanding the foregoing, the similarity between the layouts analyzed for the different alternatives does not render any of this incomplete and unavailable information essential to a reasoned choice among alternatives. Therefore, BOEM does not believe that there is incomplete or unavailable information on sea turtle resources that is essential to a reasoned choice among alternatives.

Visual Resources

There is no incomplete or unavailable information related to the analysis of impacts on visual resources.

Water Quality

There is no incomplete or unavailable information related to the analysis of impacts on water quality.

Wetlands and Other Waters of the United States

There is no incomplete or unavailable information related to the analysis of impacts on wetlands and other waters of the United States.

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APPENDIX D

Project Design Envelope and Maximum-Case Scenario

Contents

Tables

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Introduction

This environmental impact statement (EIS) assesses the impacts of the reasonable range of Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) Project (the Project) designs that are described in the Revolution Wind construction and operations plan (COP) by using the maximum-case scenario process. The maximum-case scenario analyzes the aspects of each design parameter that would result in the greatest impact for each physical, biological, and socioeconomic resource. This EIS considers the interrelationship among aspects of the project design envelope (PDE) rather than simply viewing each design parameter independently. Additional information and guidance related to the PDE concept can be found in Chapter 1 of the EIS and on BOEM's website available at https://www.boem.gov/Draft-Design-Envelope-Guidance/. Table D-1 details the full range of maximum-case design parameters for the proposed Project and which parameters are relevant to the analysis for each EIS resource section (denoted with an *X*) in Chapter 3 of the EIS.

Table D-1. Maximum-Case Scenario List of Parameter Specifications

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
WIND FARM																					
Wind farm capacity	704 megawatt (MW)	880 MW	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WIND TURBINE GENERATOR (WTG) AND MONOPILE FOUNDATION																					
Turbine size	8 MW	12 MW	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Number of WTG positions	59	100	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Distance between positions	1 nautical mile (nm) between WTGs on an east–west, north–south grid	1 nm between WTGs along north–south rows, and 0.7 mile between WTGs within east–west rows	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Total tip height	647.6 feet (197.4 meters [m])	872.7 feet (266 m)		X		X		X	X						X	X	X		X		
Hub height	377 feet (115 m)	512 feet (156 m)		X		X		X	X						X	X	X		X		
Turbine height	646 feet (197 m)	873 feet (266 m)		X		X		X	X						X	X	X		X		
Rotor diameter	538 feet (164 m)	722 feet (220 m)		X		X		X	X						X	X	X		X		
Base height (foundation height–top of transition piece)	19.7 feet (6 m)	26 feet (8 m)		X		X		X	X						X	X	X		X		
Base (tower) width (at the top)	13 feet (4 m)	21 feet (6.4 m)		X		X		X	X						X	X	X		X		

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Nacelle dimensions (length × width × height)	46 × 23 × 20 feet (14 × 7 × 6 m)	72 × 33 × 39 feet (22 × 10 × 12 m)		X		X		X	X						X	X	X		X		
Rotor swept zone area	5.2 acres (21,100 square meters [m^2])*	9.7 acres (39,400 m^2)*		X		X		X	X						X	X	X		X		
Blade length	259 feet (79 m)	351 feet (107 m)		X		X		X	X						X	X	X		X		
Blade width	16 feet (5 m)	26 feet (8 m)		X		X		X	X						X	X	X		X		
Base height (foundation height–top of transition piece)	82 feet (25 m)	128 feet (39 m)		X		X		X	X						X	X	X		X		
Air gap (mean sea level to bottom of blade tip)	93.5 feet (28.5 m)	151 feet (46 m)		X		X		X	X						X	X	X		X		
Foundation construction method	Pile driving	Pile driving	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Foundation and WTG vessel type	Jack-up vessel or derrick barge, vessel on dynamic positioning with feeder barges	Jack-up vessel or derrick barge, vessel on dynamic positioning with feeder barges	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Jack-up vessel seabed penetration of spudcans (WTG and OSS)	52 feet	52 feet	X		X			X	X			X		X	X	X	X	X	X	X	
Jack-up radius around foundations (WTG and OSS)	656 feet	656 feet	X		X			X	X			X		X	X	X	X	X	X	X	
Jack-up seabed preparation (WTG and OSS)	18.36 acres (assume all foundations need one jack up; 0.18 acre per jack up x 102 foundations = 18.36 acres)	21.14 acres (assume 15% of all foundations will need one additional jack up; 18.36 acres + 0.18*(0.15 x 102) = 21.14 acres)	X		X			X	X			X		X	X	X	X	X	X	X	
WTG coloring	RAL 9010 Pure White	RAL 7035 Light Grey				X			X						X	X	X		X		

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Bureau of Ocean Energy Management (BOEM) aviation and navigation safety recommendations (BOEM 2021)	Two synchronized L-864 aviation medium-intensity red flashing obstruction lights mounted on the WTG nacelle at a height of approximately 530 feet (161.5 m); up to three L-810 low-intensity red flashing obstruction lights mounted on the WTG tower midsection at a height of approximately 312 feet (95 m); all lights would synchronize with 30 flashes per minute for air navigation lighting	Two synchronized L-864 aviation medium-intensity red flashing obstruction lights mounted on the WTG nacelle at a height of approximately 530 feet (161.5 m); up to three L-810 low-intensity red flashing obstruction lights mounted on the WTG tower midsection at a height of approximately 312 feet (95 m); all lights would synchronize with 30 flashes per minute for air navigation lighting		X		X		X	X						X	X	X		X		
BOEM aviation and navigation safety recommendations (BOEM 2021); U.S. Coast Guard (USCG) District 1 offshore structure marking guidance (USCG 2020a)	Two white flashing obstruction lights (color to be determined depending on structure classification) on each turbine approximately 20 to 23 meters above mean lower low water on opposite corners along the same horizontal plane, each visible from all approach directions to 3 nm	Two white flashing obstruction lights (color to be determined depending on structure classification) on each turbine approximately 20 to 23 meters above mean lower low water on opposite corners along the same horizontal plane, each visible from all approach directions to 3 nm		X		X		X	X						X	X	X		X		
BOEM aviation and navigation safety recommendations; USCG District 1 offshore structure Private Aids to Navigation (PATON) marking guidance (USCG 2020b)	Flashing white light visible to 1 nm for Class C structure (to be determined by USCG)	Flashing white light visible to 5 nm for Class A structure (to be determined by USCG)		X		X		X	X						X	X	X		X		
WTG foundation coloring	RAL 1023 Yellow from water line to height of at least approximately 50 feet	RAL 1023 Yellow from water line to height of at least approximately 50 feet		X		X		X	X						X	X	X		X		
Nautical hazard prevention device	Foghorns audible to 2 nm and emit 134 decibels at 3 feet (1 m) and a tone at a frequency of 660 hertz (Hz)	Foghorns audible to 2 nm and emit 134 decibels at 3 feet (1 m) and a tone at a frequency of 660 Hz		X	X	X		X				X		X	X	X	X				

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Number of monopile foundations	61	102	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Monopile diameter	20–39 feet (tapered)	20–39 feet (tapered)	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Number of piles per foundation	1	1	X		X			X	X			X		X	X	X	X	X	X	X	
Seabed disturbance—no scour protection—per monopile foundation	0.027 acre	0.027 acre	X		X			X	X			X		X	X	X	X	X	X	X	
Monopole and scour protection area per foundation	0.7 acre	0.7 acre	X		X			X	X			X		X	X	X	X	X	X	X	
Seabed preparation per foundation	7.2 acres	7.2 acres	X		X			X	X			X		X	X	X	X	X	X	X	
Vessel anchoring/mooring per foundation	Not provided	Not provided	X		X			X	X			X		X	X	X	X	X	X	X	
Hammer size for monopile foundation	4,000 kilojoules (kJ)	4,000 kJ	X		X			X	X			X		X	X	X	X	X	X	X	
Maximum penetration depth into seabed	98 feet (monopile)	164 feet (monopile)	X		X			X	X			X		X	X	X	X	X	X	X	
Duration of pile driving (hours/pile)	1–4 hours	6–12 hours	X		X			X	X			X		X	X	X	X	X	X	X	
Duration of installation (per WTG)	36 hours	36 hours	X		X			X	X			X		X	X	X	X	X	X	X	
Duration of installation (foundations/day)	3	3	X		X			X	X			X		X	X	X	X	X	X	X	
Period of all WTG foundation pile driving	5 months	5 months	X		X			X	X			X		X	X	X	X	X	X	X	

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
OFFSHORE SUBSTATION (OSS)																					
Number of OSSs	1	2	X	X	X	X		X	X			X		X	X	X	X	X	X	X	
Period of installation and commissioning	8 months	8 months	X		X			X	X			X		X	X	X	X	X	X	X	
OSS height, excluding lighting protection	82 + 108 feet = 190 feet	190 feet		X		X		X	X						X	X	X		X		
OSS height, including lighting protection	82 + 180 feet = 262 feet	262 feet		X		X		X	X						X	X	X		X		
Topside length and width	321.5 × 216.5 feet	321.5 × 216.5 feet		X		X		X	X						X	X	X		X		
USCG lighting	See monopile turbine requirements	See monopile turbine requirements		X		X		X	X						X	X	X		X		
OSS number of piles per foundation	1	1	X		X			X	X			X		X	X	X	X	X	X	X	
Scour protection area (per monopile)	0.7 acre	0.7 acre	X		X			X	X			X		X	X	X	X	X	X	X	
Seabed preparation per foundation	7.2 acres	7.2 acres	X		X			X	X			X		X	X	X	X	X	X	X	
OSS foundation construction method	Pile driving	Pile driving	X		X			X	X			X		X	X	X	X	X	X	X	
Diameter (minimum top to maximum bottom)	20–49 feet (tapered)	20–49 feet (tapered)	X		X			X	X			X		X	X	X	X	X	X	X	
Maximum hydraulic hammer energy	4,000 kJ	4,000 kJ	X		X			X	X			X		X	X	X	X	X	X	X	
INTER-ARRAY CABLE (IAC)																					
IAC capacity	72 kilovolts (kV)	72 kV	X		X			X	X			X		X	X	X	X	X		X	
IAC diameter	8 inches	8 inches																			
IAC length	155 miles	155 miles	X		X			X	X			X		X	X	X	X	X		X	

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Maximum disturbance depth	10 feet	10 feet	X		X			X	X			X		X	X	X	X	X		X	
Target burial depth	4 feet	6 feet	X		X			X	X			X		X	X	X	X	X		X	
Disturbance corridor- cable only (width)	131 feet	131 feet	X		X			X	X			X		X	X	X	X	X		X	
Period of installation of the complete IAC system	5 months	5 months	X		X			X	X			X		X	X	X	X	X		X	
IAC installation rate	400 m/hour	400 m/hour	X		X			X	X			X		X	X	X	X	X		X	
IAC general disturbance corridor	2,471 acres	2,471 acres	X		X			X	X			X		X	X	X	X	X		X	
IAC seabed disturbance due to boulder clearance (80% of total length)	1,976.8 acres	1,976.8 acres	X		X			X	X			X		X	X	X	X	X		X	
IAC seabed disturbance due to sandwave leveling/ dredging (10% of total length)	247.1 acres	247.1 acres	X		X			X	X			X		X	X	X	X	X		X	
IAC secondary cable protection (10% of total length)	74.1 acres	74.1 acres	X		X			X	X			X		X	X	X	X	X		X	
OFFSHORE SUBSTATION-LINK CABLE (OSS-LINK CABLE)																					
OSS-link cable capacity	275 kV	275 kV	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable length	9 miles	9 miles	X		X			X	X			X		X	X	X	X	X		X	
Number of OSS-link cables	1	1	X		X			X	X			X		X	X	X	X	X		X	
Cable diameter	11.8 inches	11.8 inches	X		X			X	X			X		X	X	X	X	X		X	

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Target burial depth	4 feet	6 feet	X		X			X	X			X		X	X	X	X	X		X	
Disturbance corridor (width)	131 feet	131 feet	X		X			X	X			X		X	X	X	X	X		X	
Maximum disturbance depth	10 feet	10 feet	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable installation rate	400 m/hour	400 m/hour	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable general disturbance corridor	148.0 acres	148.0 acres	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable seabed disturbance due to boulder clearance (60% of total length)	89 acres	89 acres	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable seabed disturbance due to sandwave leveling/ dredging (10% of total length)	14.8 acres	14.8 acres	X		X			X	X			X		X	X	X	X	X		X	
OSS-link cable protection (10% of total length)	4.4 acres	4.4 acres	X		X			X	X			X		X	X	X	X	X		X	
SUMMARY OF RWEC SEGMENT LENGTHS OFFSHORE																					
RWEC: OCS	Up to 19 miles (per cable)		X	X		X			X	X			X		X	X	X	X	X		X
RWEC: Rhode Island	23 miles (per cable)		X	X		X			X	X			X		X	X	X	X	X		X
Total RWEC segment lengths offshore	Approximately 42 miles (per cable)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
RWEC OFFSHORE																					
RWEC capacity	275 kV	275 kV	X		X			X	X			X		X	X	X	X	X		X	
Number of RWECs	1	2	X		X			X	X			X		X	X	X	X	X		X	
RWEC diameter	11.8 inches	11.8 inches	X		X			X	X			X		X	X	X	X	X		X	
Disturbance corridor (width)	131 feet, up to 673 feet at joint locations	131 feet, up to 673 feet at joint locations	X		X			X	X			X		X	X	X	X	X		X	
Operational right-of-way (ROW)	1,640 feet	1,640 feet	X		X			X	X			X		X	X	X	X	X		X	
Target burial depth (offshore)	4 feet	6 feet	X		X			X	X			X		X	X	X	X	X		X	
RWEC installation rate	400 m/hour	400 m/hour	X		X			X	X			X		X	X	X	X	X		X	
Period of installation	8 months	8 months	X		X			X	X			X		X	X	X	X	X		X	
RWEC: trench width	up to 43 feet	up to 43 feet	X		X			X	X			X		X	X	X	X	X		X	
RWEC: Outer Continental Shelf (OCS) submarine cable general disturbance corridor	593.1 acres	593.1 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: OCS boulder clearance (40% of route, included in general disturbance corridor amount)	237.2 acres	237.2 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: OCS sandwave leveling (45% of route, included in general disturbance corridor amount)	266.9 acres	266.9 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: OCS cable protection (10% of route for each cable)	17.8 acres	17.8 acres	X		X			X	X			X		X	X	X	X	X		X	

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
RWEC: OCS cable omega joints (two total)	20.4 acre	20.4 acre	X		X			X	X			X		X	X	X	X	X		X	
RWEC: cable protection per crossing (with existing submarine assets)	20.8 acres	20.8 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: Rhode Island (RI) submarine cable general disturbance corridor	731.4 acres	731.4 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: RI boulder clearance (70% of route, included in general disturbance corridor amount)	512 acres	512 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: RI sandwave leveling (7% of route, included in general disturbance corridor amount)	51.2 acres	51.2 acres	X		X			X	X			X		X	X	X	X	X		X	
RWEC: RI cable protection (10% of route for each cable)	21.9 acres	21.9 acres	X		X			X	X			X		X	X	X	X	X		X	
Vessel anchoring corridor	1,640 feet	1,640 feet																			

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
RWEC AT LANDFALL																					
Landfall work area	3.1 acres	3.1 acres	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Transition join bays (located within the landfall work area)	1,340 square feet	1,340 square feet	X				X		X				X				X			X	X
Temporary cofferdam exit pits (2X) for horizontal directional drilling (HDD) construction (located within landfall work area)	0.24 acre	0.94 acre	X				X		X				X				X			X	X
ONSHORE TRANSMISSION CABLE AND PROJECT COMPONENTS																					
Landfall sites	Multiple landfall sites are currently being evaluated within the approximate 20-acre landfall envelope, located at Quonset Point in North Kingstown, Rhode Island.		X	X	X		X	X		X	X	X		X				X		X	X
Landfall work area	3.1 acres within the landfall envelope, located at Quonset Point in North Kingstown, Rhode Island		X	X	X		X	X		X	X	X		X				X		X	X
Landfall transition method	HDD with possible cofferdam		X	X	X		X	X		X	X	X		X				X		X	X
Temporary anchor wall driven depth	20 feet		X	X	X		X	X		X	X	X		X				X		X	X
HDD cable duct diameter	3 feet		X	X	X		X	X		X	X	X		X				X		X	X
HDD cable duct length	0.6 mile		X	X	X		X	X		X	X	X		X				X		X	X

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Landfall transition	Underground concrete transition vault		X	X	X		X	X		X	X	X		X				X		X	X
Onshore construction location	Single thermal concrete duct bank and splice vaults		X	X	X		X	X		X	X	X		X				X		X	X
Onshore construction method	Open trench (8-foot-wide trench within 25-foot-wide temporary disturbance corridor that expands to 30 × 75 feet at splice vaults) with HDD or other trenchless technology as needed		X	X	X		X	X		X	X	X		X				X		X	X
Onshore cable route	Landfall work area to The Narragansett Electric Company d/b/a National Grid (TNEC) Davisville Substation		X	X	X		X	X		X	X	X		X				X		X	X
Transition joint bays	67 × 10 × 10 feet																				
Onshore transmission cable corridor length	Approximately 1 mile		X	X	X		X	X		X	X	X		X				X		X	X
Onshore interconnection facility location	Immediately adjacent to the existing Davisville Substation in North Kingstown, Rhode Island		X	X	X		X	X		X	X	X		X				X		X	X
Length of underground ROW connecting the onshore substation (OnSS) to the interconnection facility	527 feet		X	X	X		X	X		X	X	X		X				X		X	X
Length of overhead ROW connecting the interconnection facility to the Davisville Substation	474 feet		X	X	X		X	X		X	X	X		X				X		X	X

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Onshore interconnection facility limit of work size	4 acres		X	X	X		X	X		X	X	X		X				X		X	X
OnSS (property size)	15 acres		X	X	X		X	X		X	X	X		X				X		X	X
OPERATIONS AND MAINTENANCE (O&M) FACILITY																					
Port of Montauk	A new building with up to 1,000 square feet of office space and up to 6,000 square feet of equipment storage space would be constructed at the Port of Montauk.	A new building with up to 1,000 square feet) of office space and up to 6,000 square feet of equipment storage space would be constructed at the Port of Montauk.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Port of Davisville at Quonset Point	A new building with up to 1,000 square feet of office space and up to 11,000 square feet of equipment storage space would be constructed at the Port of Davisville at Quonset Point.	A new building with up to 1,000 square feet of office space and up to 11,000 square feet of equipment storage space would be constructed at the Port of Davisville at Quonset Point.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Port of Brooklyn	There are no plans to establish an O&M building at, or otherwise implement improvements to, the Port of Brooklyn, and use of this port is assumed to be limited to existing facilities maintained by the port.	There are no plans to establish an O&M building at, or otherwise implement improvements to, the Port of Brooklyn, and use of this port is assumed to be limited to existing facilities maintained by the port.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Port of Galilee	There are no plans to establish an O&M building at, or otherwise implement improvements to, the Port of Galilee, and use of this port is assumed to be limited to existing facilities maintained by the port.	There are no plans to establish an O&M building at, or otherwise implement improvements to, the Port of Galilee, and use of this port is assumed to be limited to existing facilities maintained by the port.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Design Parameter	Minimum Design Size	Maximum Design Size	3.4 Air Quality	3.5 Bats	3.6 Benthic Habitat and Invertebrates	3.7 Birds	3.8 Coastal Habitats and Fauna	3.9 Commercial Fisheries and For-Hire Recreational Fishing	3.10 Cultural Resources	3.11 Demographics, Employment, and Economics	3.12 Environmental Justice	3.13 Finfish and Essential Fish Habitat	3.14 Land Use and Coastal Infrastructure	3.15 Marine Mammals	3.16 Navigation and Vessel Traffic	3.17 Other Uses	3.18 Recreation and Tourism	3.19 Sea Turtles	3.20 Visual Resources	3.21 Water Quality	3.22 Wetlands and Other Waters of the United States
Port Jefferson	An existing upland building within an office park located approximately 6 miles from Port Jefferson. This building would serve as a regional O&M hub and headquarters for Orsted and multiple offshore wind projects. The building was recently purchased by Northeast Offshore, LLC, and has internal upgrades planned to establish office and warehouse space.	An existing upland building within an office park located approximately 6 miles from Port Jefferson. This building would serve as a regional O&M hub and headquarters for Orsted and multiple offshore wind projects. The building was recently purchased by Northeast Offshore, LLC, and has internal upgrades planned to establish office and warehouse space.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes: In this appendix, distances in miles are in statute miles (miles used in the traditional sense) or nautical miles (miles used specifically for marine navigation). Statute miles are more commonly used and are referred to simply as miles, whereas nautical miles are referred to by name or by their abbreviation “nm.” Numbers that were calculated are rounded to the closest whole number.

* This value was calculated based on information provided.

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APPENDIX E

Planned Activities Scenario and Reasonably Foreseeable Future Activities and Projects

Contents

Tables

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Planned Activities Scenario

The impacts resultant from the planned activities scenario are the incremental effects of the Proposed Action on the environment added to other reasonably foreseeable planned actions in the area (40 Code of Federal Regulations [CFR] 1502.15). This appendix discusses resource-specific planned activities that could occur if Project impacts occur in the same location and time frame as impacts from other reasonably foreseeable planned actions. The *Project* here is the construction, operations and maintenance (O&M), and decommissioning of a wind energy project located within the Bureau of Ocean Energy Management's (BOEM's) Renewable Energy Lease Area OCS-A 0486, approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island and approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island.

BOEM anticipates that impacts could occur between the start of Project construction in 2023 and the completion of Project decommissioning which would occur within two years of the end of the lease (up to 35 years post-construction). The geographic analysis area (GAA) is defined by the impact-producing factor with the maximum geographic area of impact, for example sound during pile driving. For the mobile resources, bats, birds, finfish and invertebrates, marine mammals, and sea turtles, the species potentially impacted 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. The purpose of these analysis areas is to capture the impacts from planned activities to each of those resources potentially impacted by the Proposed Action. The GAA for each resource area is defined in the resource area sections of the EIS.

In this appendix, distances in miles are in statute miles (miles used in the traditional sense) or nautical miles (miles used specifically for marine navigation). This appendix uses statute miles more commonly and refers to them simply as *miles*, whereas nautical miles are referred to by name or abbreviation *nm*.

Reasonably Foreseeable Future Activities and Projects

This section includes a list and description of other reasonably foreseeable activities that could contribute to cumulative impacts within the defined GAA for each resource category. Projects or actions that are considered speculative per the definition provided in 43 CFR 46.30[1] are noted in subsequent tables but excluded from the planned activities impact analysis in Chapter 3.

Planned (cumulative) activities described in this section consist of 10 types of actions: 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; 7) fisheries use and management; 8) global climate change; 9) oil and gas activities; and 10) onshore development activities.

[1] 43 CFR 46.30 – Reasonably foreseeable future actions include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a responsible official of ordinary prudence would take such activities into account in reaching a decision. The federal and non-federal activities that BOEM must take into account in the analysis of cumulative impacts include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by BOEM. Reasonably foreseeable future actions do not include those actions that are highly speculative or indefinite.

BOEM analyzed the possible extent of future other offshore wind energy development activities on the Atlantic Outer Continental Shelf (OCS) to determine reasonably foreseeable cumulative effects measured by installed power capacity. Table E-1 represents the status of projects as of January 1, 2022. The methodology for developing the scenario is largely the same as for the Vineyard Wind project (BOEM 2021a) and is outlined in the footnotes in Table E3-1.

Table E-1. Offshore Wind Activities on the U.S. Atlantic Coast (dates shown as of November 1, 2021)

Lease Number	States	Lessee/Developer Name	Project Name	Construction Date	Operations Date	Facility Description	BOEM Permitting Stage*	Power Purchase Agreement/ Offshore Renewable Energy Certificate Status
Active Projects (state)								
N/A (state project)	Maine	New England Aqua Ventus, LLC	NE Aquaventus	2023	2023	11 MW (1 WTG)	N/A	PPA with ME
N/A (state project)	Rhode Island	Deepwater Wind, LLC (now Orsted)	Block Island Wind Farm	2015	2016	30 MW (5 WTGs)	N/A	PPA with RI
Active Projects (federal)								
OCS-A 0483	Virginia	Virginia Electric and Power Company (dba Dominion Virginia Power)	Virginia Commercial Offshore Wind (per SAP)	2024–2025	2026	2,640 MW (205 WTGs); one met buoy	SAP approved; New SAP submitted and approved; COP in progress	No PPAs signed to date
OCS-A 0486	Rhode Island and Connecticut	Revolution Wind, LLC (Orsted and Eversource)	Revolution Wind (Proposed Action)	2023	2023	Up to 880 MW (100 WTGs; two OSSs)	COP in progress; SAP approved	2 PPAs with CT and one PPA with RI
OCS-A 0487; OCS-A 0500 (portions)	New York	Orsted and Eversource	Sunrise Wind	2023	2024	Up to 1,122 MW (102 WTGs)	COP submitted	OREC awarded by NYSERDA (PPA with NY)
OCS-A 0490 (portion)	Maryland	U.S. Wind Inc.	U.S. Wind (Maryland Offshore Wind Project)	2024	2024	1500 MW (125 WTGs)	COP submitted; SAP approved	OREC awarded by State of Maryland
OCS-A 0497	Virginia	Virginia Department of Mines, Minerals and Energy (Orsted and Dominion Energy)	Coastal Virginia Offshore Wind	2021	2021	12 MW (two WTGs-6 MW each); one wave/current buoy	Operating	N/A (research)
OCS-A 0498	New Jersey	Ocean Wind, LLC (Orsted and PSEG)	Ocean Wind	2023	2024	1,100 MW (98 WTGs)	COP in progress SAP approved	OREC awarded by NJ
OCS-A 0499	New Jersey	Atlantic Shores Offshore Wind, LLC	Atlantic Shores	2025	2027	Up to 200 WTG (capacity not provided)	SAP approved; COP submitted	Project 1 has an OREC signed with NJ for 1,510 MW. Project 2 has no OREC or PPAs signed to date.
OCS-A 0500 (portion)	Massachusetts	Bay State Wind LLC (Orsted and Eversource)	Bay State Wind	2026	2027	800 MW; two FLIDAR buoys; one met buoy	COP in progress SAP approved	No PPA signed to date
OCS-A 0501 (north)	Massachusetts	Vineyard Wind LLC	Vineyard Wind 1	2023	2023	800 MW (62 WTGs); two met buoys	ROD issued	PPA with MA
OCS-A 0534 and portion of OCS-A 0501	Massachusetts	New England Wind, LLC	Park City Wind (Phase 1) Commonwealth Wind (Phase 2)	2024	2026	Up to a combined 2,304 MW (130 WTGs or ESP	COP in progress	PPA with CT (Phase 1) No PPA signed to date (Phase 2)

Lease Number	States	Lessee/Developer Name	Project Name	Construction Date	Operations Date	Facility Description	BOEM Permitting Stage*	Power Purchase Agreement/ Offshore Renewable Energy Certificate Status
						positions) for both phases		
OCS-A 0508	North Carolina, Virginia	Avangrid Renewables, LLC	Kitty Hawk Offshore	2025	2026	Up to 69 WTGs; up to two buoys; and up to two platforms	COP in progress; SAP approved	No PPA signed to date
OCS-A 0512 (Project 1 and Project 2)	New York	Equinor Wind US, LLC	Empire Wind 1, Empire Wind 2	2024	2025	Up to 2,400 MW (174 WTGs); two met buoys; one wave/met buoy; one subsea current meter mooring	COP in progress; SAP approved	PPA with NY
OCS-A 0517	New York	South Fork Wind, LLC (Orsted and Eversource)	South Fork Wind Farm	2023	2023	130 MW (up to 12 WTGs); one met buoy	ROD issued COP approved	PPA with NY
OCS-A 0519 (portion; includes former OCS-A 0482)	Delaware, Maryland	Skipjack Offshore Energy, LLC (Orsted)	Skipjack	2023	2023	192 MW (up to 16 WTGs); one met buoy	COP received	OREC awarded by State of Maryland (connection to PJM grid in DE)
OCS-A 0521	Massachusetts	Mayflower Wind Energy, LLC (Shell & EDP Renewables)	Mayflower	2025	2025	Up to 1,600 – 2,400 MW (147 WTGs); one met buoy	SAP approved	PPA with MA (up to 804 MW) Applying for other PPAs
Future Projects (federal)								
OCS-A 0482	Delaware	GSOE I LLC (Orsted and PSEG)	Garden State Offshore Energy	By 2030, spread over 2023–2030			SAP approved	PPA with DE and NJ
OCS-A 0487 (remainder)	Rhode Island	Sunrise Wind, LLC	TBD	By 2030, spread over 2025–2030			SAP approved	No PPAs signed to date
OCS-A 0499	New York/New Jersey	Atlantic Shores	TBD	By 2030, spread over 2026–2030			–	No PPAs signed to date
OCS-A 0500 (remainder)	Massachusetts	Bay State Wind LLC (Orsted and Eversource)	Bay State Wind	By 2030, spread over 2025–2030			SAP approved	No PPAs signed to date
OCS-A 0508 (remainder)	Virginia/North Carolina	Avangrid Renewables, LLC	Kitty Hawk Wind, South	2026–2027			–	No PPAs signed to date
OCS-A 0519 (remainder)	Maryland/Delaware	Skipjack Offshore Energy, LLC (Orsted)	To be determined (TBD)	By 2030, spread over 2023–2030			SAP approved	No PPAs signed to date
OCS-A 0520	TBD (New England)	Equinor Wind US LLC	Beacon Wind	2025–2026			SAP submitted	No PPA signed to date
OCS-A 0522	Massachusetts	Vineyard Wind LLC	Liberty Wind	By 2030, spread over 2025–2030			SAP submitted	No PPAs signed to date

Lease Number	States	Lessee/Developer Name	Project Name	Construction Date	Operations Date	Facility Description	BOEM Permitting Stage*	Power Purchase Agreement/ Offshore Renewable Energy Certificate Status
OCS-A 0532	New Jersey	(Orsted North America)	Ocean Wind 2	By 2030, spread over 2026–2030			SAP approved	OREC awarded by NJ for 1,148 MW
OCS-A 0537	New York/New Jersey		Central Bight	By 2030, spread over 2026–2030			Lease issuance	No PPAs signed to date
OCS-A 0538	New York/New Jersey		Hudson South B				Lease issuance	No PPAs signed to date
OCS-A 0539	New York/New Jersey		Hudson South C				Lease issuance	No PPAs signed to date
OCS-A 0541	New York/New Jersey		Hudson South E				Lease issuance	No PPAs signed to date
OCS-A 0542	New York/New Jersey		Hudson South F				Lease issuance	No PPAs signed to date
OCS-A 0544	New York/New Jersey		Hudson North				Lease issuance	No PPAs signed to date

Notes: – = no data; COP = construction and operations plan; CT = Connecticut; DE = Delaware; MA = Massachusetts; MD = Maryland; ME = Maine; MW = megawatts; NA = not applicable; NJ = New Jersey; NY = New York; NYSERDA = New York State Energy Research and Development Authority; OREC = offshore renewable energy certificate; PPA = power purchase agreement; RI = Rhode Island; ROD = record of decision; SAP = site assessment plan; TBD = to be determined; WTGs = wind turbine generators.

* Under BOEM Permitting Stage, COP status is assumed to be in process, under review, or not yet commenced based on publicly available information.

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Offshore Wind Energy Development Activities

Site Characterization Studies

A lessee is required to provide the results of site characterization activities with its site assessment plan (SAP) or COP. For the purposes of the planned activities effects analysis, BOEM makes the following assumptions for survey and sampling activities:

- Site characterization would occur on all existing leases.
- Site characterization would likely take place in the first 3 years following execution of a lease, since a lessee would likely want to generate data for its COP at the earliest possible opportunity.
- Lessees would likely survey most or all of the proposed lease area during the 5-year site assessment term to collect required geophysical information for siting of a meteorological tower and/or two buoys and commercial facilities (wind turbines). The surveys may be completed in phases, with the meteorological tower and/or buoy areas likely to be surveyed first.
- Lessee would not use air guns, which are typically used for deep penetration two-dimensional or three-dimensional exploratory seismic surveys to determine the location, extent, and properties of oil and gas resources (BOEM 2016).

Table E-2 summarizes the typical site characterization surveys, the types of equipment and/or method used, and which resources the survey information would inform (BOEM 2013, 2016).

Table E-2. Site Characterization Survey Assumptions

Survey Type	Survey Equipment and/or Method	Resource Surveyed or Information Used to Inform
High-resolution geophysical surveys	Side-scan sonar, sub-bottom profiler, magnetometer, multi-beam echosounder	Shallow hazards, archaeological, Bathymetric charting, benthic habitat
Geotechnical/ sub-bottom sampling	Vibracores, deep borings, cone penetration tests	Geological
Biological	Grab sampling, benthic sled, underwater imagery/ sediment profile imaging	Benthic habitat
	Aerial digital imaging; visual observation from boat or airplane	Bird
	Ultrasonic detectors installed on survey vessels used for other surveys	Bat
	Visual observation from boat or airplane	Marine fauna (marine mammals and sea turtles)
	Direct sampling of fish and invertebrates	Fish

Source: BOEM (2016)

Site Assessment Activities

After SAP approval, a lessee can evaluate the meteorological conditions, such as wind resources, with the approved installation of meteorological towers and/or buoys. Site assessment activities have been approved or are in the process of being approved for multiple lease areas consisting of one to three meteorological buoys per SAP (see Table E-1). Site assessment would likely take place starting within 1 to 2 years of lease execution, because preparation of a SAP (and subsequent BOEM review) takes time. This planned activities analysis considers these site assessment activities.

Construction and Operation of Offshore Wind Facilities

Table E-1 lists all offshore wind leasing activities that BOEM considers reasonably foreseeable by lease areas and projects, their permitting stage/assessment, and anticipated timeline.

Monitoring and Mitigation

Future offshore wind projects could require monitoring or mitigation as part of BOEM approvals under the National Environmental Policy Act (NEPA) and OCSLA. Although specific measures are too speculative to include at this time, BOEM anticipates that measures could include actions such as passive acoustic monitoring, trawl surveys, acoustic telemetry, and gillnet or ventless trap surveys.

Commercial Fisheries Cumulative Fishery Effects Analysis

Incorporation by Reference of Cumulative Impacts Study

BOEM has completed a study of impact-producing factors (IPFs) on the North Atlantic OCS to consider in an offshore wind development cumulative impacts scenario (BOEM 2019), which is incorporated by reference. The study identifies cause-and-effect relationships between renewable energy projects and resources and classifies those relationships into a manageable number of IPFs through which renewable energy projects could affect resources. It also identifies the types of actions and activities to be considered in a cumulative impacts scenario. The study identifies actions and activities that may affect the same physical, biological, economic, or cultural resources as renewable energy projects and states that such actions and activities may have the same IPFs as offshore wind projects.

The BOEM (2019) study identifies the relationships between IPFs associated with specific past, present, and reasonably foreseeable actions and activities in the North Atlantic OCS which were incorporated into this EIS analysis. If an IPF was not associated with the RWF Project, it was not included in the impacts analysis of planned activities.

As discussed in the BOEM (2019) study, reasonably foreseeable activities other than offshore wind projects may also affect the same resources as the proposed Project or other offshore wind projects, possibly via the same IPFs or via IPFs through which offshore wind projects do not contribute. This Appendix E lists reasonably foreseeable non-offshore wind activities that may contribute to the cumulative impacts of the proposed Project.

Undersea Transmission Lines, Gas Pipelines, and Other Submarine Cables

The following existing undersea transmission lines, gas pipelines, and other submarine cables are located near the Project:

- New Shoreham (Block Island), Rhode Island, is served by a submarine power cable from the Block Island Wind Farm to New Shoreham (Block Island).
- A submarine power cable connects Block Island to the mainland electrical grid at Narragansett, Rhode Island.
- Service to Martha's Vineyard is provided by four electric cables from Falmouth, located in three corridors through Vineyard Sound. Two cables are located in the same corridor between Elm Road in Falmouth and West Chop; one is located between Shore Street in Falmouth and Eastville (East Chop), and one connects between Mill Road in Falmouth and West Chop.
- Two cables service Nantucket through Nantucket Sound, from Dennis Port and Hyannis Port to landfall at Jetties Beach.
- Additional submarine cables, including fiber-optic cables and trans-Atlantic cables that originate near Charlestown, Rhode Island; New York City; Long Island, near Trenton, New Jersey; and Wall, New Jersey, are located offshore New England and mid-Atlantic states, but outside the proposed Lease Area.
- Two natural gas pipelines are located offshore Boston, Massachusetts, in Massachusetts Bay and lead to liquified natural gas (LNG) export facilities: the Neptune pipeline and the Northeast Gateway LNG pipeline.

The offshore wind projects listed in Table E-1 that have a COP under review are presumed to include at least one identified cable route. Cable routes have not yet been announced for the remainder of the proposed wind energy projects in Table E-1.

Tidal Energy Projects

The following tidal energy projects have been proposed or studied on the U.S East Coast and are in operation or considered reasonably foreseeable:

- The Bourne Tidal Test Site, located in the Cape Cod Canal near Bourne, Massachusetts, is a testing platform for tidal turbines that was installed in late 2017 by the Marine Renewable Energy Collaborative. The Bourne Tidal Test Site offers a test platform for tidal turbines (MRECo 2017, 2018).
- Cobscook Bay Tidal Project, located in Maine, is a Federal Energy Regulatory Commission- (FERC) licensed tidal project that began operations in 2012. The project owner, Ocean Power Energy Company, has informed FERC that it will not apply for relicensing, and removal and site restoration activities are anticipated to be conducted prior to its current license expiration date in January 2022 (FERC 2012a).

- Western Passage Tidal Energy Project, a proposed tidal energy site in the Western Passage, received a preliminary permit from FERC in 2016. The preliminary permit allows developers to study a project but does not authorize construction.
- The Roosevelt Island Tidal Energy (RITE) Project located in the East Channel of the East River, a tidal strait connecting the Long Island Sound with the Atlantic Ocean in the New York Harbor. In 2005, Verdant Power petitioned FERC for permission to the first U.S. commercial license for tidal power. In 2012, FERC issued a 10-year license to install up to 1 MW of power (30 turbines/10 TriFrames) at the RITE project (FERC 2012b; Verdant Power 2018).

Dredging and Port Improvement Projects

- The following dredging projects have been proposed or studied between New York, New York, and Boston, Massachusetts, and are either in operation or are considered reasonably foreseeable:
- The U.S. Army Corps of Engineers (USACE) New England District partnership with Rhode Island Coastal Resources Management Council (RI CRMC) proposes a project that would dredge approximately 23,700 cubic yards of sandy material from the Point Judith Harbor Federal Navigation Project to widen the existing 15-foot-deep mean lower low water (MLLW) West Bulkhead channel by 50 feet and extend the same channel approximately 1,200 feet into the North Basin area (USACE 2018a).
- The Plymouth Harbor Federal Navigation Project in Plymouth, Massachusetts, includes maintenance dredging of approximately 385,000 cubic yards of sand and silt from approximately 75 acres of the authorized project area in order to restore the project to authorized and maintained dimensions (USACE 2018b).
- The Port of New Bedford was awarded a $15.4 million U.S. Department of Transportation Better Utilizing Investments to Leverage Development grant to improve the port's infrastructure and to help with the removal of contaminated materials. The funding will be used to extend the port's bulkhead, creating room for 60 additional commercial vessels, and additional sites for offshore wind staging (Phillips 2018).
- Proposed New Haven Harbor Improvements would include deepening the main ship channel, maneuvering area, and turning basin to -40 feet MLLW and widening the main channel and turning basin to allow larger vessels to efficiently access the Port of New Haven’s terminals. The proposed improvements would remove approximately 4.28 million cubic yards of predominately glacially deposited silts from the federal channel (USACE 2018c).
- The Nature Conservancy seeks a permit to place an artificial reef array in Narraganset Bay at 130 Shore Road in Narragansett Bay in East Providence, Rhode Island. The proposed work involves the construction of a 0.14-acre artificial reef using 91 pre-fabricated reef modules. The artificial reef array would consist of 58 Pallet Balls (4.0 × 2.9 feet) and 33 Bay Balls (3 × 2 feet). The reef modules would be transported to the project site by barge and lowered to the seafloor by crane (USACE 2019).
- The RI CRMC has awarded funding for five habitat restoration projects in the 19th year of its Rhode Island Coastal and Estuarine Habitat Restoration Trust Fund (RI CRMC 2022). These

projects comprise a dam removal assessment, streambank stabilization on the Woonasquatucket River, salt marsh restoration, habitat restoration and invasive species management, and fish passage improvement on the Saugatucket River (RI CRMC 2018a).

- The Town of Dennis seeks a permit for the selective dredging of multiple navigation and mooring basins within multiple waterways in the towns of Dennis and Yarmouth. Suitable dredged material will be used as nourishment on multiple town-owned beaches in Dennis whereas material that is not deemed suitable for beach nourishment will be disposed of at the Cape Cod Bay Disposal Site and at the South Dennis Landfill. The town is requesting to dredge approximately 434,310 cubic yards from portions of these waterways over 10 years encompassing an area of approximately 96.03 acres (USACE 2018d).

The following port improvement projects have been proposed in Connecticut, Rhode Island, Massachusetts, and/or New Jersey, and are either in operation or are considered reasonably foreseeable:

- The Connecticut Port Authority (CPA) announced a $93 million public-private partnership to upgrade the Connecticut State Pier in New London to support the offshore wind industry (Sheridan 2019). According to the Connecticut Maritime Strategy 2018 (CPA 2018a), New London is the only major port between New York and Maine that does not have vertical obstruction and offshore barriers, two factors that are critical for offshore wind turbine assembly. The document includes strategic objectives to manage and redevelop the Connecticut State Pier partially to support the offshore wind industry, which could create a dramatic increase in demand for the Connecticut State Pier and regional job growth. The development partnership, announced in May 2019, includes a 3-year plan to upgrade infrastructure to meet heavy-lift requirements of Orsted and Eversource offshore wind components (Cooper 2019). Redevelopment of the Connecticut State Pier is considered a reasonably foreseeable activity.
- In Rhode Island, Revolution Wind, LLC has committed to investing approximately $40 million in improvements at the Port of Providence, the Port of Davisville at Quonset Point, and possibly other Rhode Island ports for the Revolution Wind Project (Kuffner 2018). This investment will position Rhode Island ports to participate in construction and operation of future offshore wind projects in the region (Rhode Island Governor’s Office 2018). The Port of Davisville has added a 150-megaton mobile harbor crane, which will enable the port to handle wind turbines and heavy equipment, and enables the Port of Davisville to participate in regional offshore wind projects (Port of Davisville 2017). Further improvements at Rhode Island ports to support the offshore wind industry are considered reasonably foreseeable.
- The Massachusetts Clean Energy Center (MassCEC) has identified 18 waterfront sites in Massachusetts that may be available and suitable for use by the offshore wind industry. Potential activities at these sites include manufacturing of offshore wind transmission cables, manufacture and assembly of turbine components, substation manufacturing and assembly, O&M bases, and storage of turbine components (MassCEC 2017a, 2017b, 2017c).
- The MassCEC manages the New Bedford Marine Commerce Terminal in New Bedford, Massachusetts. The 29-acre facility was completed in 2015 and is the first in North America designed specifically to support the construction, assembly, and deployment of offshore wind projects (MassCEC 2018). The New Bedford Port Authority Strategic Plan 2018–2023 contains

goals related to expanding the New Bedford Marine Commerce Terminal to improve and expand services to the offshore wind industry, including development of North Terminal with the capacity to handle two separate offshore wind installation projects in the future (Port of New Bedford 2018). Vineyard Wind signed an 18-month lease with the Marine Commerce Terminal in October 2018 (Port of New Bedford 2020) and has supported the New Bedford Port Authority with grants to develop publicly owned facilities to support shore-based operations for offshore wind facilities (Vineyard Wind 2019).

Marine Minerals Use and Ocean Dredged Material Disposal

The closest active lease in BOEM's Marine Minerals Program for sand borrow areas for beach replenishment is located offshore New Jersey near Harvey Cedars, Surf City, Long Beach Township, Ship Bottom, and Beach Haven (Lease Number OCS-A-0505) (BOEM 2018).

In addition, reconnaissance and/or design-level OCS studies along the East Coast from Rhode Island to Florida have identified potential future sand resources. Sand resources identified nearest the Project include locations offshore Rhode Island (between Block Island and Charlestown), Long Island (Rockaway Beach, Long Beach, and Fire Island, New York), and Sandy Hook, New Jersey.

The EPA Region 1 is responsible for designating and managing ocean disposal sites for materials offshore in the region of the Project. The USACE issues permits for ocean disposal sites; all ocean sites are for the disposal of dredged material permitted or authorized under the Marine Protection, Research, and Sanctuaries Act (16 USC 1431 et seq. and 33 USC 1401 et seq.). There are nine active projects along the Massachusetts, Rhode Island, Connecticut, and New York coasts, with the closest dredge disposal project, the Rhode Island Sound Disposal Site (RISDS) located northeast of Block Island (USACE 2018e).

Military Use

Military activities can include various vessel training exercises, submarine and antisubmarine training, and U.S. Air Force exercises. The U.S. Navy, the U.S. Coast Guard (USCG), and other military entities have numerous facilities in the region. Major onshore regional facilities include Joint Base Cape Cod, Naval Station Newport, Newport Naval Undersea Warfare Center, Naval Submarine Base New London, and USCG Academy (BOEM 2013; Epsilon Associates, Inc 2018; RI CRMC 2010). The U.S. Atlantic Fleet also conducts training and testing exercises in the Narraganset Bay Operating Area, and the Newport Naval Undersea Warfare Center routinely performs testing in the area (BOEM 2013).

Marine Transportation

Marine transportation in the region is diverse and sourced from many ports and private harbors from New York to Massachusetts. Commercial vessel traffic in the region includes research, tug/barge, liquid tankers (such as those used for liquid petroleum), cargo, military and search-and-rescue vessels, and commercial fishing vessels. Recreational vessel traffic includes cruise ships, sailboats, and charter boats. A number of federal agencies, state agencies, educational institutions, and environmental non-governmental organizations participate in ongoing research offshore including oceanographic, biological, geophysical, and archaeological surveys.

One new regional maritime highway project that has received funding from the U.S. Department of Transportation (USDOT) Maritime Administration (MARAD) is a new barge service (Davisville/Brooklyn/ Newark Container-on-Barge Service). This service is proposed to run twice each week in state waters between Newark, New Jersey; Brooklyn, New York; and the Port of Davisville in Rhode Island (USDOT MARAD 2021), which is located on Quonset Point, one of the potential O&M locations. The project received grant funding from MARAD in August 2018 (fiscal year 2017) to purchase material for handling equipment for the biweekly barge service (USDOT MARAD 2022).

National Marine Fisheries Service Activities

Research and enhancement permits may be issued for marine mammals protected by the Marine Mammal Protection Act (MMPA) and for threatened and endangered species under the ESA. The National Marine Fisheries Service (NMFS) is anticipated to continue issuing research permits under section 10(a)(1)(A) of the ESA to allow take of certain ESA-listed species for scientific research. Scientific research permits issued by NMFS currently authorize studies on ESA-listed species in the Atlantic Ocean, some of which occur in portions of the Lease Area. Current fisheries management and ecosystem monitoring surveys conducted by or in coordination with the Northeast Fisheries Science Center (NEFSC) could overlap with offshore wind lease areas in the New England region and south into the Mid-Atlantic region. Surveys include 1) the NEFSC Bottom Trawl Survey, a more than 50-year multispecies stock assessment tool using a bottom trawl; 2) the NEFSC Sea Scallop/Integrated Habitat Survey, a sea scallop stock assessment and habitat characterization tool, using a bottom dredge and camera tow; 3) the NEFSC Surfclam/Ocean Quahog Survey, a stock assessment tool for both species using a bottom dredge; and 4) the NEFSC Ecosystem Monitoring Program, a more than 40-year shelf ecosystem monitoring program using plankton tows and conductivity, temperature, and depth units. These surveys are anticipated to continue within the region, regardless of offshore wind development.

The regulatory process administered by NMFS, which includes stock assessments for all marine mammals and 5-year reviews for all ESA-listed species, assists in informing decisions on take authorizations and the assessment of project-specific and cumulative impacts that consider past, present, and reasonably foreseeable future actions in biological opinions. Stock assessments completed regularly under MMPA include estimates of potential biological removal that stocks of marine mammals can sustainably absorb. MMPA take authorizations require that a proposed action have no more than a negligible impact on species or stocks, and that a proposed action impose the least practicable adverse impact on the species. MMPA authorizations are reinforced by monitoring and reporting requirements so that NMFS is kept informed of deviations from what has been approved. Biological opinions for federal and non-federal actions are similarly grounded in status reviews and conditioned to avoid jeopardy and to allow continued progress toward recovery. These processes help to ensure that, through compliance with these regulatory requirements, a proposed action would not have a measurable impact on the conservation, recovery, and management of the resource.

Directed Take Permits for Scientific Research and Enhancement

NMFS issues permits for research on protected species for scientific purposes. These scientific research permits include the authorization of directed take for activities such as capturing animals and taking measurements and biological samples to study their health, tagging animals to study their distribution and migration, photographing and counting animals to get population estimates, taking animals in poor health to an animal hospital, and filming animals. NMFS also issues permits for enhancement purposes; these permits are issued to enhance the survival or recovery of a species or stock in the wild by taking actions that increase an individual's or population's ability to recover in the wild. In waters near the Lease Area, scientific research and enhancement permits have been issued previously for satellite, acoustic, and multi-sensor tagging studies on large and small cetaceans, research on reproduction, mortality, health, and conservation issues for North Atlantic Right Whales, and research on population dynamics of harbor and gray seals. Reasonably foreseeable future impacts from scientific research and enhancement permits include physical and behavioral stressors (e.g., restraint and capture, marking, implantable and suction tagging, biological sampling).

Fisheries Use and Management

NMFS implements regulations to manage commercial and recreational fisheries in federal waters, including those within which the Project would be located; the State of New York, state of Rhode Island, and Commonwealth of Massachusetts regulate commercial fisheries in state waters (within 3 nautical miles of the coastline). There are several aquaculture sites in Narragansett Bay; however, the Lease Area and the RWEC centerline does not intersect any of these sites (Suffolk County 2018). The closest aquaculture site to the RWEC centerline is located on the western shoreline of Conanicut Island, approximately 1,427 feet (435 m) from the RWEC route centerline (vhb 2022).

The project overlaps two of NMFS' eight regional councils to manage federal fisheries: Mid-Atlantic Fishery Management Council (MAFMC) which includes New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and North Carolina; and New England Fishery Management Council (NEFMC), which includes Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut (NEFMC 2016). The councils manage species with many fishery management plans that are frequently updated, revised, and amended and coordinate with each other to jointly manage species across jurisdictional boundaries (MAFMC 2019). Many of the fisheries managed by the councils are fished for in state waters or outside of the Mid-Atlantic region, so the council works with the Atlantic States Marine Fisheries Commission (ASMFC). ASMFC is composed of the 15 Atlantic coast states and coordinates the management of marine and anadromous resources found in the states' marine waters. In addition, the lobster and Jonah crab fisheries are cooperatively managed by the states and NMFS under the framework of the ASMFC (2019).

The fishery management plans of the Councils and ASMFC were established, in part, to manage fisheries to avoid overfishing. They accomplish this through an array of management measures, including annual catch quotas, minimum size limits, and closed areas. These various measures can further reduce (or increase) the size of landings of commercial fisheries in the Northeast and the Mid-Atlantic regions.

NOAA Fisheries also manages highly migratory species (HMS), such as tuna and sharks, that can travel long distances and cross domestic boundaries.

Global Climate Change

Section 7.6.1.4 of the *Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf* (Minerals

Management Service [MMS] 2007) describes global climate change with respect to assessing renewable energy development. Climate change is predicted to affect Northeast fishery species differently (Hare et al. 2016), and the NMFS biological opinion discusses in detail the potential impacts of global climate change on protected species that occur within the proposed action area (NMFS 2013).

The Intergovernmental Panel on Climate Change (IPCC) released a special report in October 2018 that compared risks associated with an increase of global warming of 1.5 degrees Celsius (°C) and an increase of 2°C. The report found that climate-related risks depend on the rate, peak, and duration of global warming, and that an increase of 2°C was associated with greater risks associated with climatic changes such as extreme weather and drought; global sea level rise; impacts to terrestrial ecosystems; impacts to marine biodiversity, fisheries, and ecosystems and their functions and services to humans; and impacts to health, livelihoods, food security, water supply, and economic growth (IPCC 2018).

States and regions look to offshore wind as a key component in their strategic plans to meet emissions goals in part because offshore wind can provide a low-carbon/no-carbon electricity supply source for current and increasing needs of electrified heating and transportation. Offshore wind projects produce less net greenhouse gas (GHG) emissions over the life of the projects when compared to other energy sources currently in use. Table E-3 summarizes regional plans and policies that are in place to address climate change, and Table E-4 summarizes resiliency plans.

Table E-3. Climate Change Plans and Policies

Plans and Policies	Summary/Goal
Connecticut	
2008 Global Warming Solutions Act	Sets forth statutory requirements to reduce GHG emissions 10% below 1990 levels by 2020 and 80% below 2001 levels by 2050 (State of Connecticut 2008).
Control of Carbon Dioxides Emissions/CO_2 Budget Trading Program (2008)	Sets forth statutory requirements to establish a carbon dioxide (CO_2) allowance tracking system wherein CO_2 allowance allocations are established under the Connecticut CO_2 Budget Trading Program Base Budget. Budget sources are identified, cataloged, monitored and reported, transferred, and tracked under a certification program in an effort to cap and reduce power sector CO_2 emissions.
Regional Greenhouse Gas Initiative (RGGI) (2009)	The nation's first mandatory, market-based cap-and-trade program to reduce emissions of CO_2. Under the program, which began in 2009, participating RGGI states (Rhode Island, Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New York, Vermont, and New Jersey; New Jersey withdrew in 2011) established a regional cap on CO_2 emissions from fossil fuel–fired electric generating facilities, and required these power plants to possess a tradable CO_2 allowance for each ton of CO_2 they emit. Under RGGI, CO_2 allowances are distributed through quarterly allowance auctions.
An Act Concerning Electric and Fuel Cell Electric Vehicles (Public Act 16-135) (2016)	Sets forth several provisions related to electric vehicles (EVs), including requirements related to data collection, EV charging stations, and electric rate structures.
Building A Low Carbon Future for Connecticut: Achieving a 45% GHG reduction by 2030 (2018)	Proposed set of strategies to achieve 45% GHG reduction below 2001 levels target by 2030. These strategies ensure Connecticut is on a downward trajectory to the 80% reduction target by 2050 required by the Global Warming Solutions Act (State of Connecticut 2018a).
2018 Act Concerning Climate Change Planning and Resiliency (Public Act 18-82)	Act passed by the Connecticut General Assembly that adopted GC3's recommendation of 45% GHG mid-term reduction target below 2001 levels by 2030 and integrates GHG reduction more explicitly into the DEEP Comprehensive Energy Strategy (CES) and Integrated Resource Plan (IRP) (State of Connecticut 2018b).
Comprehensive Energy Strategy (CES) (2018)	Connecticut Department of Energy and Environmental Protection (DEEP) update to Connecticut's CES to advance the State's goal of creating a cheaper, cleaner, more reliable energy future for Connecticut's residents and businesses. The CES analyzes energy use and key trends of the region (State of Connecticut 2018c)
Executive Order No. 3, (2019)	Re-establishes and expands the membership and responsibilities of the Governor's Council on Climate change (GC3), originally established in 2015. Orders GC3 to report to the Governor regarding the state's progress on the implementation of the strategies identified in *Building a Low Carbon Future for Connecticut: Achieving a 45% GHG reduction by 2030* (State of Connecticut 2019)

Plans and Policies	Summary/Goal
Integrated Resources Plan (2020)	DEEP is required to prepare an Integrated Resource Plan (IRP) every 2 years, which is comprised of an assessment of the future electric needs and a plan to meet those future needs. Executive Order 3 directed DEEP to analyze pathways and recommend strategies to achieve a 100 percent zero carbon electric supply by 2040 in this IRP (State of Connecticut 2020).
Taking Action on Climate Change and Building a More Resilient Connecticut for All (2021)	Phase 1 report in response to Executive Order 3's request for progress on mitigation strategies and preparation of an Adaptation and Resilience Plan. Provides information on GC3 members and Working Group members, GC3 background and process, the Equity and Environmental Justice Working Group, the impacts of climate change in Connecticut, and recommendations for near-term action (State of Connecticut 2021)
Massachusetts	
Global Warming Solutions Act (GWSA) of 2008	Framework to reduce GHG emissions by requiring 25% reduction in emissions from all sectors below 1990 baseline emission level in 2020, at least 80% reduction in 2050. Full implementation of these policies is projected to result in total net reduction of 25.0 million metric tons of CO_2 equivalent, or 26.4% below 1990 baseline level (Commonwealth of Massachusetts 2018a).
Massachusetts Clean Energy and Climate Plan (CECP) for 2020; 2015 CECP Update	Policies that aim to reduce GHG emissions in the commonwealth across all sectors; full implementation of policies would result in reducing emissions by at least 25% below 1900 level in 2020 (Commonwealth of Massachusetts 2015).
Executive Order 569, Establishing an Integrated Climate Strategy for the Commonwealth and "Act to Promote Energy Diversity" (2016)	Calls for large procurements of offshore wind and hydroelectric resources (Commonwealth of Massachusetts 2016).
Environmental Bond Bill and An Act to Advance Clean Energy (2018)	Sets new targets for offshore wind, solar, and storage technologies; expands Renewable Portfolio Standard requirements for 2020–2029; establishes a Clean Peak Standard; and permits fuel switching in energy efficiency programs (Commonwealth of Massachusetts 2018a).
Massachusetts State Hazard Mitigation and Climate Adaption Plan 2018	Updated 2013 plan to comprehensively integrate climate change impacts and adaptation strategies with hazard mitigation planning while complying with federal requirements for state hazard mitigation plans and maintaining eligibility for federal disaster recovery and hazard mitigation funding under the Stafford Act. The plan will next be submitted to the Federal Emergency Management Agency (FEMA) for approval. In 2020, a new 2030 emissions limit and CECP for 2030 will be published (Commonwealth of Massachusetts 2018a, 2018b).
Massachusetts 2050 Decarbonization Roadmap	A planning process by the Massachusetts Executive Office of Energy and Environmental Affairs to identify cost-effective and equitable strategies to ensure Massachusetts reduces GHG emissions by at least 85% by 2050 and achieves net-zero emissions (Commonwealth of Massachusetts 2020a)

Plans and Policies	**Summary/Goal**
Massachusetts Clean Energy and Climate Plan (CECP) for 2030	The Clean Energy and Climate Plan for 2030 (2030 CECP) provides details on the actions the Commonwealth will undertake through the next decade to ensure the 2030 emissions limit is met. The 2030 CECP is prepared in coordination with the development of the 2050 Decarbonization Roadmap such that the strategies, policies, and actions outlined in the 2030 CECP can help the Commonwealth achieve net zero GHG emissions by 2050. The Interim 2030 CECP was built upon the 2020 CECP and the 2015 CECP Update (Commonwealth of Massachusetts 2020b).
2030 GHG Emissions Limit	The 2030 emissions limit of 45% below the 1990 GHG emissions level was set on December 30, 2020, in accordance with Executive Order 569 to help the Commonwealth meet the 2050 emissions limit (Commonwealth of Massachusetts 2020c)
Net Zero by 2050 Emissions Limit	A 2050 statewide emissions limit of net zero GHG emissions was established by the Commonwealth. This is defined as a level of statewide GHG emissions that is equal in quantity to the amount of CO_2 or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level (Commonwealth of Massachusetts 2020d).
New York	
Reforming the Energy Vision (New York State 2014)	State’s energy policy to build integrated energy network; Clean energy goal to reduce GHGs by 40% by 2030 and by 80% by 2050.
Order Adopting a Clean Energy Standard (State of New York Public Service Commission 2016)	Requirement that 50% of New York’s electricity come from renewable energy sources by 2030.
New York State Energy Plan 2015; 2017 Biennial Report to 2015 Plan (New York State Energy Research Development Authority [NYSERDA] 2015, 2017a)	Requires 40% reduction in GHGs from 1990 levels; 50% electricity will come from renewable energy resources; and 600 trillion British thermal units (Btu) increase in statewide energy efficiency.

Plans and Policies	Summary/Goal
Governor Cuomo State of State Address 2017, 2018, 2021	2017: Set offshore wind energy development goal of 2,400 MW by 2030 (Governor's Office 2017a). 2018: Procurement of at least 800 MW of offshore wind power between two solicitations in 2018 and 2019; new energy efficiency target for investor-owned utilities to more than double utility energy efficiency progress by 2025; energy storage initiative to achieve 1,500 MW of storage by 2025 and up to 3,000 MW by 2030 (Governor Office 2018b, 2018c). 2021: The governor's 2021 agenda—Reimagine | Rebuild | Renew—establishes a goal of building out its renewable energy program. The agenda notes the development of two new offshore wind farms more than 20 miles off the shore of Long Island, the creation of dedicated offshore port facilities, and additional transmission capacity development.
New York State Offshore Wind Master Plan (2017) (NYSERDA 2017b)	Grants NYSERDA ability to award 25-year long-term contracts for projects ranging from approximately 200 MW to approximately 800 MW, with an ability to award larger quantities if sufficiently attractive proposals are received. Each proposer is also required to submit at least one proposal of approximately 400 MW. Bids are due in February 2019, awards are expected in spring 2019; and contracts are expected to be executed thereafter.
2020 Offshore Wind Solicitation	As noted above, NYSERDA has provisionally awarded two offshore wind projects, totaling 2,490 MW. Empire Wind 2 (1,260 MW) and Beacon Wind (1,230 MW) of Equinor Wind US LLC will generate enough clean energy to power 1.3 million homes and will be major economic drivers, supporting the following: • More than 5,200 direct jobs • Combined economic activity of $8.9 billion in labor, supplies, development, and manufacturing statewide • $47 million in workforce development and just access funding
The Climate Leadership and Community Protection Act (CLCPA), enacted on July 18, 2019, signed into law in July 2019 and effective January 1, 2020	CLCPA establishes economy-wide targets to reduce GHG emissions by 40% of 1990 levels by 2030 and 85% of 1990 levels by 2050.
Rhode Island	
Air Pollution Control Regulation No. 37-Rhode Island's Low-Emission Vehicle Program (2001)	The purpose of this regulation is to specify the requirements for Rhode Island's Low-Emission Vehicle Program to reduce motor vehicle GHG emissions.
Air Pollution Control Regulation No. 46, 'CO2 Budget Trading Program' (2008)	The purpose of this regulation is to establish the Rhode Island component of the CO_2 Budget Trading Program, which is designed to reduce anthropogenic emissions of CO_2 from the CO_2 budget sources in an economically efficient manner. Budget sources are identified, cataloged, monitored and reported, transferred, and tracked under a certification program in an effort to cap and reduce power sector CO_2 emissions.

Plans and Policies	**Summary/Goal**
RGGI (2009)	The RGGI is the nation's first mandatory, market-based cap-and-trade program to reduce emissions of CO_2. Under the program, which began in 2009, Rhode Island receives CO_2 allowance proceeds, which are invested in a variety of consumer benefit programs, including energy efficiency, renewable energy, direct energy bill assistance and other GHG reduction programs.
Resilient Rhode Island Act (2014)	Established the Executive Climate Change Coordinating Council (EC4) and set specific GHG reduction targets; incorporates consideration of climate change impacts into the powers and duties of all state agencies (State of Rhode Island 2014).
Energy 2035 Rhode Island State Energy Plan (2015)	Long-term comprehensive strategy for energy services across all sectors using a secure, cost-effective, and sustainable energy system; plan to increase sector fuel diversity, produce net economic benefits, and reduce GHG emissions by 45% by the year 2035 (State of Rhode Island 2015b).
Governor’s Climate Priorities (2018) Executive Order 15-17, 17-06	Increasing in-state renewable energy tenfold by 2020 (to 1,000 MWs) through new development and regional procurement (State of Rhode Island 2015a, 2017, 2018a).
Rhode Island Greenhouse Gas Emissions Reductions Plan (2016)	Targets for GHG reductions: 10% below 1990 levels by 2020; 45% below 1990 levels by 2035; 80% below 1990 levels by 2040 (State of Rhode Island 2016).
Resilient Rhody (2018)	Planning document outlining climate resiliency actions; focuses on leveraging emissions reduction targets and adaptation (State of Rhode Island 2018b).
Executive Order 20-01, Advancing a 100% Renewable Energy Future for Rhode Island by 2030	Calls the Rhode Island Office of Energy Resources (OER) to conduct economic and energy market analyses to develop an actionable plan to reach 100% renewable electricity by 2030. The OER must provide this specific and implementable action plan by December 31, 2020 (State of Rhode Island 2020a).
The Road to 100% Renewable Electricity by 2030 in Rhode Island	Provides economic analysis of the key factors that will guide Rhode Island in the coming years as the state accelerates its adoption of carbon-free renewable resources. The OER developed specific policy, programmatic, planning, and equity-based actions that will support achieving the 100% renewable electricity goal (Rhode Island OER 2020).
2021 Act on Climate	This legislation updates Rhode Island’s climate-emission reduction goals laid out in the 2014 Resilient RI Act and address areas such as environmental injustices, public health inequities, and a fair employment transition as fossil-fuel jobs are replaced by green energy jobs. The state will develop a plan to incrementally reduce climate emissions to net-zero by 2050 and is to be updated every 5 years (State of Rhode Island 2020b).

Table E-4. Resiliency Plans and Policies in the Lease Area

Plans and Policies	Summary
Connecticut	
Act Authorizing Municipal Climate Change and Coastal Resiliency Reserve Funds (CCCRRF) (Public Act 19-77)	Act approved July 1, 2019. Upon the recommendation of the chief elected official and budget-making authority, and approval of the legislative body of a municipality, the reserve fund may be used and appropriated to pay for municipal property losses, capital projects and studies related to mitigating hazards and vulnerabilities of climate change including, but not limited to, land acquisition (Connecticut General Assembly 2019).
Resilient Connecticut	Connecticut Institute for Resilience & Climate Adaptation (CIRCA) was awarded an $8 million from the National Disaster Relief Competition(NDRC) to develop the *Resilient Connecticut* project. Coordination of CIRCA, state agencies, and regional councils of governments and municipalities initiated the development of a Planning Framework to establish resilient communities through smart planning that incorporates economic development framed around transit-oriented development, conservation strategies, and critical infrastructure improvements (Resilient Connecticut (CIRCA 2021).
An Act Concerning Climate Change Adaptation (Public Act 21-115)	Act approved July 6, 2021. This proposal addresses the rising seas, frequent flooding, heat waves, and drought expected between now and 2050. It prioritizes the protection of frontline vulnerable communities and provides Connecticut's communities more options to move from adaptation and resilience planning to implementing their project pipeline, including the use of nature-based and green infrastructure solutions (Connecticut General Assembly 2021).
Massachusetts	
Municipal Vulnerability Preparedness grant program (MVP) (2017)	Provides support for cities and towns to plan for resiliency and implement key climate change adaptation actions for resiliency. The City of New Bedford has received MVP designation as of November 1, 2018 (Commonwealth of Massachusetts 2019a).
Coastal Grant and Resilience Program	Provides financial and technical support for local efforts to increase awareness and understanding of climate impacts, identify and map vulnerabilities, conduct adaptation planning, redesign vulnerable public facilities and infrastructure, and implement non-structural approaches that enhance natural resources and provide storm damage protection (Commonwealth of Massachusetts 2019b).
General Appropriations Bill, FY2022 (Section 2000-0101)	Designation of funds for the Executive Office of Energy and Environmental Affairs to coordinate and implement strategies for climate change adaptation and preparedness, including, but not limited to, resiliency plans for the commonwealth in a report to be delivered by February 3, 2022 (Commonwealth of Massachusetts Legislature 2021).

Plans and Policies	Summary
New York	
Part 490 of Community Risk and Resiliency Act (CRRA) of 2014	Establishes statewide science-based sea-level rise projections for coastal regions of the state. As of 2019, DEC is in the process of developing a State Flood Risk Management Guidance document for state agencies (New York State Department of Environmental Conservation [NYSDEC] n.d. [2019]).
NY Rising Community Reconstruction (NYRCR) (2018)	$20.4 million in projects on Long Island to help flood-prone communities plan and prepare for extreme weather events as they continue projects to recover from Superstorm Sandy, Hurricane Irene, and Tropical Storm Lee. Three projects were announced for Suffolk County and five for Nassau County (Governor's Office 2018c).
Water Infrastructure Improvement Act (WIIA), Water Quality Improvement Project (WQIP) Program, and Intermunicipal Grant (IMG)	$600 million available to communities statewide for programs to fund projects to upgrade infrastructure and make communities more resilient to flooding and other impacts of climate-driven severe storms and weather events (Governor's Office 2021).
Rhode Island	
Nantucket's Coastal Resilience Plan	The plan is currently under development, and while no actions have been identified to date, potential shoreline management activities could include sediment management, construction of seawalls and similar structures, and other activities (Town and County of Nantucket 2018a, 2018b).
Shoreline Change Special Area Management Plan (Beach SAMP)	The RI CRMC developed and adopted the Beach SAMP to improve the state's resilience and manage the shoreline (RI CRMC 2018b).

Oil and Gas Activities

The proposed Project is located in the North Atlantic Planning Area of the OCS Oil and Gas Leasing Program (National OCS Program). On September 8, 2020, the White House issued a presidential memorandum for the Secretary of the Interior on the withdrawal of certain areas of the U.S. OCS from leasing disposition for 10 years, including the areas currently designated by BOEM as the South Atlantic and Straits of Florida Planning Areas (The White House 2020a). The South Atlantic Planning Area includes the OCS off South Carolina, Georgia, and northern Florida. On September 25, 2020, the White House issued a similar memorandum for the Mid-Atlantic Planning Area that lies south of the northern administrative boundary of North Carolina (The White House 2020b). This withdrawal prevents consideration of these areas for any leasing for purposes of exploration, development, or production during the 10-year period beginning July 1, 2022, and ending June 30, 2032. However, at this time, there has been no decision by the Secretary of the Interior regarding future oil and gas leasing in the North Atlantic or remainder of the Mid-Atlantic Planning Areas. Existing leases in the withdrawn areas are not affected.

BOEM issues geological and geophysical (G&G) permits to obtain data for hydrocarbon exploration and production; locate and monitor marine mineral resources; aid in locating sites for alternative energy structures and pipelines; identify possible human-made, seafloor, or geological hazards; and locate potential archeological and benthic resources. G&G surveys are typically classified into the following categories by equipment and survey type:

- deep-penetration seismic airgun surveys (2-D, 3-D, 4-D, ocean-bottom nodal, and azimuth multi-vessel surveys)
- airgun HRG surveys that are used to investigate the shallow subsurface for geohazards (also known as shallow hazard surveys) and that are used during initial site evaluation, drilling rig emplacement, and platform or pipeline design and emplacement
- electromagnetic surveys, deep stratigraphic and shallow test drilling, and various remote-sensing methods
- non-airgun HRG surveys (similar to those used to support OCS wind energy leasing and site assessment activities) to detect and monitor geohazards, archaeological resources, and benthic communities
- geological and geotechnical seafloor sampling (similar to those used to support OCS wind energy leasing and site assessment activities) to assess the suitability of seafloor sediments for supporting structures (e.g., platforms, pipelines, and cables)

Detailed information on each of the specific G&G survey types and descriptions can be found in Appendix F of *Gulf of Mexico OCS Proposed Geological and Geophysical Activities: Western, Central, and Eastern Planning Areas; Final Programmatic Environmental Impact Statement* (BOEM 2017).

There are currently no G&G permits under BOEM review for areas offshore of the northeast Atlantic states; however, areas under consideration for G&G surveys are located in federal waters offshore from Delaware to Florida (BOEM 2021b).

Eight LNG ports are located on the East Coast of the United States. Table E-5 lists existing, approved, and proposed LNG ports on the East Coast of the United States that provide (or may in the future provide) services such as natural gas export, natural gas supply to the interstate pipeline system or local distribution companies, or storage of LNG for periods of peak demand, or production of LNG for fuel and industrial use (FERC 2021).

Table E-5. Liquid Natural Gas Terminals Located in the Northeastern United States

Terminal Name	Type	Company	Jurisdiction	Distance from Project (approximate)	Status
Everett, MA	Import terminal	GDF SUEZ—DOMAC	FERC	90 miles north	Existing
Offshore Boston, MA	Import terminal	GDF SUEZ – Neptune LNG	U.S. Department of Transportation Maritime Administration (MARAD)/USCG	100 miles north	Existing
Offshore Boston, MA	Import terminal, authorized to re-export delivered LNG	Excelerate Energy—Northeast Gateway	MARAD/USCG	95 miles north	Existing
Cove Point, MD (Chesapeake Bay)	Import terminal	Dominion—Cove Point LNG	FERC	340 miles southwest	Existing
Cove Point, MD (Chesapeake Bay)	Export terminal	Dominion—Cove Point LNG	FERC	340 miles southwest	Existing
Elba Island, GA (Savannah River)	Import terminal	El Paso—Southern LNG	FERC	835 miles southwest	Existing
Elba Island, GA (Savannah River)	Export terminal	Southern LNG Company	FERC	835 miles southwest	Existing
Jacksonville, FL	Export terminal	Eagle LNG Partners	FERC	960 miles southwest	Approved

Source: FERC (2021)

Onshore Development Activities

Onshore development activities that may contribute to impacts from planned activities include visible infrastructure such as onshore wind turbines and cell towers, port development, and other energy projects such as transmission and pipeline projects. Coastal development projects permitted through regional planning commissions and towns may also contribute to impacts from planned activities. These may include residential, commercial, and industrial developments spurred by population growth in the region (Table E-6).

Table E-6. Existing, Approved, and Proposed Onshore Development Activities

Type	Description
Local planning documents	• Suffolk County Master Plan (Suffolk County 2015) • A City Master Plan: New Bedford 2020 (City of New Bedford 2010) • Town of North Kingstown Comprehensive Plan Update 2008 (Town of North Kingstown 2008) • Washington County Transfer of Development Rights (TDR) Study (Washington County Regional Planning Council 2012) • North Kingstown Comprehensive Plan Re-Write 2019 (Interface Studio 2019)
Onshore wind projects	• According to the U.S. Geological Survey (USGS), there are nine onshore wind projects located within the 41-mile viewshed of the project (USGS 2018).
Communications towers	• There are numerous communications towers located in Suffolk County, on offshore islands, and within the viewshed of the proposed Project components. Within the recreation/tourism geographic analysis area, there are 864 communications towers, 10 of which exceed the Federal Aviation Administration (FAA) height limit for marking/lighting requirements (FAA 2016). • The East Hampton Town Board is replacing its aging 800-megahertz frequency emergency communication system tower to a 700-megahertz system with updated equipment. This will require the replacement of a 150-foot communication tower with a 300-foot lattice tower and the raising of a 55-foot monopole to 85 feet. This upgrade also requires replacing antennas at towers near the East Hampton Airport in Wainscott, at the Amagansett firehouse, and at the East Hampton Town Hall complex (Chinese 2018).
Development projects	• As a part of New York State’s $100 billion infrastructure project, $5.6 billion will go to transform the Long Island Railroad (LIRR) to improve system connectivity. Within Suffolk County, the following stations will receive funds for upgrades: Brentwood, Deer Park, East Hampton, Northport, Ronkonkoma, Stony Brook, Port Jefferson, and Wyandanch. The East Hampton historic LIRR station will undergo upgrades and modernizations (Metropolitan Transit Authority 2017; Governor’s Office 2017b). Additional plans for transit-oriented design (TOD) and highway improvements are planned in Suffolk County in state and county planning documents. • The Division of Statewide Planning, Rhode Island Department of Transportation, and Rhode Island Public Transit Authority prepared the Rhode Island State Transportation Improvement Program (STIP) for the Federal Fiscal Year (FFY) 2022-2023 for the adoption by the State Planning Council (State of Rhode Island 2021). • Fire Island Inlet to Montauk Point (FIMP) Project is a $1.2 billion project by the USACE, NYDEC, and Long Island, NY, municipalities to engage in inlet management; beach, dune and berm construction; breach response plans; raising and retrofitting 4,400 homes; road-raising; groin modifications; and coastal process features. Within Suffolk County, portions of the Towns of Babylon, Islip, Brookhaven, Southampton, and East Hampton; 12 incorporated villages along Long Island’s south shore (mainland); Fire Island National Seashore; and the Poospatuck and Shinnecock Indian Reservations will be involved in this project (USACE 2018f).

<table>
<tr><th>Type</th><th>Description</th></tr>
<tr><td></td><td>The USACE is working to remediate and cleanup a former defense site (former NIKE Battery PR-58 and Disaster Village Training Area) at Quonset Development Corporation in North Kingstown, RI. A feasibility study was performed from 2014 to 2016, and the final remedial investigation/feasibility study was published in 2016. Pre-design investigations, followed by remedial designs and engineering plans, and remedial action is proposed for 2021 (USACE 2018g).
The Massachusetts Department of Environmental Protection (MassDEP) Bureau of Air and Waste approved National Grid’s application for the construction and operation of a diesel generator and a battery electric storage system at an existing electric generating facility located at 32 Bunker Road in Nantucket, approximately 1 mile north of the coastline. The facilities are anticipated to be operational in 2019 (MassDEP 2017; Utility Dive 2018).</td></tr>
<tr><td>Port studies/upgrades</td><td>The USACE completed the Lake Montauk Harbor Feasibility Study in 2020. The study determined that Lake Montauk Harbor has insufficient channel and depth to support commercial fishing fleet activities. The study evaluated a range of alternative navigation improvement plans; the recommended plan consisted of deepening the existing navigation channel to -17 feet MLLW depth, creating a deposition basin immediately east of the channel at a width of 100 feet, and placing dredged material on the shoreline west of the inlet for a distance of 3,000 feet and a width of approximately 44 feet.

Ports in New York, Connecticut, Rhode Island, and Massachusetts may require upgrades to support the offshore wind industry developing in the northeastern United States. Upgrades may include onshore developments or underwater improvements (such as dredging).
In December 2017, NYSERDA issued an offshore wind master plan that assessed 54 distinct waterfront sites along the New York Harbor and Hudson River and 11 distinct areas with multiple small sites along the Long Island coast. Twelve waterfront areas and five distinct areas were singled out for “potential to be used or developed into facilities capable of supporting OSW projects” (Table 26; NYSERDA 2017b). Nearly all identified sites would require some level of infrastructure upgrade (from minimal to significant) depending on OSW activities intended for the site. Particular sites of interest include Red Hook-Brooklyn, South Brooklyn Marine Terminal, and the Port of Coeymans (NYSERDA 2017b). For additional information regarding specific proposed improvements to these ports, see DockNYC (2018), Capital Region Economic Development Council (2018), American Association of Port Authorities (2016), Rulison (2018), and New York City Economic Development Corporation (2018).
The CPA is currently evaluating proposals from parties to develop, finance, and manage the Connecticut State Pier in New London under a long-term operating agreement (CPA 2018b). According to the Connecticut Maritime Strategy 2018 (CPA 2018a), New London is the only major port between New York and Maine that does not have vertical obstruction and offshore barriers, two factors that are critical for offshore wind turbine assembly. The document includes strategic objectives to manage and redevelop the Connecticut State Pier partially to support the offshore wind industry, which could create a dramatic increase in demand for the Connecticut State Pier and regional job growth. Redevelopment of the State Pier is considered a reasonably foreseeable activity, though specific redevelopment plans are not yet available.
In Rhode Island, DWW has committed to investing approximately $40 million in improvements at the Port of Providence, the Port of Davisville at Quonset Point, and possibly other Rhode Island ports for the Revolution Wind Project (Kuffner 2018). The</td></tr>
</table>

Type	Description
	Port of Davisville has added a 150-megaton mobile harbor crane, which will enable the port to handle wind turbines and heavy equipment, and enables the Port of Davisville to participate in regional offshore wind projects (Port of Davisville 2017). Further improvements at Rhode Island ports to support the offshore wind industry are considered reasonably foreseeable. • The MassCEC has identified 18 waterfront sites in Massachusetts that may be available and suitable for use by the offshore wind industry. Potential activities at these sites include manufacturing of offshore wind transmission cables, manufacture and assembly of turbine components, substation manufacturing and assembly, O&M bases, and storage of turbine components (MassCEC 2017a, 2017b, 2017c). The Draft New Bedford Port Authority Strategic Plan 2018 – 2023 contains goals related to expanding the New Bedford Marine Commerce Terminal to improve and expand services to the offshore wind industry (MassCEC 2018; Port of New Bedford 2018), but no new improvements were identified. • New York State proposed port improvements include the governor's 2021 agenda—Reimagine | Rebuild | Renew—which includes upgrades to create five dedicated port facilities for offshore wind, including the following: • The nation's first offshore wind tower manufacturing facility, to be built at the Port of Albany • An offshore wind turbine staging facility and O&M hub to be established at the South Brooklyn Marine Terminal • Increasing the use of the Port of Coeymans for cutting-edge turbine foundation manufacturing • Buttressing ongoing O&M out of Port Jefferson and Port of Montauk Harbor in Long Island

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APPENDIX E1

Description and Screening of Relevant Offshore Wind and Non–Offshore Wind Impact-Producing Factors and Negligible Impact Determinations

Contents

Tables

Introduction

The Bureau of Ocean Energy Management (BOEM) developed the tables in Appendix E1 for each resource category based on the 2019 study titled *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). The next page provides an overview table of the impact-producing factors (IPFs) considered for each resource in the environmental impact statement (EIS).

Tables E1-1 to E2-21 provide an analysis of the relevant ongoing and future non–offshore wind activities by IPF for each resource, as well as a reference to where in the Revolution Wind Farm and Revolution Export Cable Project EIS each of those IPFs is analyzed in relation to future offshore wind activities and the Proposed Action and alternatives, if applicable. Some IPFs were determined either not applicable or to have negligible impacts and therefore do not warrant detailed analysis in the EIS pursuant to 40 CFR 1502.15. In these cases, IPF analysis is solely provided in Tables E1-1 to E2-21.

A full list of abbreviations is provided in the EIS's Abbreviations section. Please refer to this section for abbreviations used in the tables in this appendix.

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Appendix E1 Overview Table

IPFs	Air		Bats		Benthic Habitat and Invertebrates		Birds		Coastal Habitats and Fauna		Commercial Fisheries and For-Hire Recreational Fishing		Cultural Resources		Demographics, Employment, and Economics		Environmental Justice		Finfish and Essential Fish Habitat		Land Use and Coastal Infrastructure		Marine Mammals		Navigation and Vessel Traffic		Other Uses		Recreation and Tourism		Sea Turtles		Visual Resources		Water Quality		Wetlands and Other Waters of the United States	
	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On	Off	On
Accidental releases	X	X			X		X	X			X		X	X				X	X		X	X	X				X	X			X				X	X		X
Air emissions	X	X															X	X																				
Anchoring					X						X		X						X						X				X	X	X				X			
Bycatch					X																		X								X							
Discharges					X													X									X	X							X	X		X
Electromagnetic fields					X														X		X	X	X								X							
Energy generation, energy security															X																							
Light			X	X	X		X	X			X		X	X	X		X		X		X	X	X				X	X	X	X	X		X	X				
New cable emplacement and maintenance				X	X		X	X		X	X		X	X	X		X	X	X		X	X	X		X		X	X	X	X	X				X	X		
Noise			X	X	X		X	X		X	X						X	X	X		X	X	X				X	X	X	X	X							
Port utilization					X							X				X			X		X	X	X		X		X	X	X	X	X				X	X		
Presence of structures			X	X	X		X	X		X	X		X	X	X		X	X	X		X	X	X		X		X	X	X	X	X		X	X	X	X		X
Regulated fishing effort											X																											
Sediment deposition and burial					X														X				X								X							X
Traffic					X		X	X			X				X	X	X	X	X				X		X	X	X		X	X	X							
Climate change	X	X			X		X	X		X	X		X	X	X		X		X				X				X	X			X							
Ocean acidification					X		X	X											X				X								X							

Notes: Off = Offshore, On = Onshore

Air Quality

Table E1-1. Summary of Activities and the Associated Impact-Producing Factors for Air Quality

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/ hazmat	Accidental releases of air toxics or HAPS are due to potential chemical spills. Ongoing releases occur in low frequencies. These could lead to short-term periods of toxic pollutant emissions through surface evaporation. According to the U.S. Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution Federation Limited (2021), which collects data on oil spills from tankers and other sources. From 1990 to1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and offshore it was less than 70,000 barrels.	Accidental releases of air toxics or HAPS would be due to potential chemical spills. See Table E1-4 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. These could lead to short-term periods of toxic pollutant emissions through evaporation. Air quality impacts would be short term and limited to the local area at and around the accidental release location.	Air quality impacts associated with accidental spills from other reasonably foreseeable projects could also occur; however, releases would be short term, localized, and generally small in volume and would not contribute to air quality in measurable amounts. Therefore, impacts to air quality would be **negligible** adverse.	**Offshore:** Alternatives B through F would result in air quality impacts from air emissions associated with accidental spills during construction and installation. Releases would be short term, localized, and generally small in volume and would not contribute to air quality in measurable amounts. Construction under Alternatives C through F could result in a reduced risk of inadvertent spills due to the reduced number of installed WTGs, resulting in a potential decrease in Project-related spill emissions. However, impacts to air quality under Alternatives B through F would still be **negligible** adverse. Once the RWF has been constructed, spills are unlikely. Air quality impacts associated with any accidental spills would be short term, localized, and generally small in volume and would not contribute to air quality in measurable amounts. Alternatives C through F would result in O&M and decommissioning impacts to air quality at quantities and durations similar to, or slightly reduced from, the Proposed Action. However, impacts to air quality under Alternatives B through F would be **negligible** adverse. BOEM estimates that the Project would result in a 56% incremental increase in total chemical usage over the No Action Alternative in the water quality geographic analysis area. However, with the implementation of EPMs and compliance with regulations, the incremental additional effects of accidental releases from the Proposed Action would not contribute appreciably to overall impacts on air quality. Project-related accidental spills or discharges, including those associated with vessel allisions or collisions, associated with Alternatives C through F would result in air quality impacts at quantities and durations similar to, or slightly reduced from, the Proposed Action. Therefore, when combined with past, present, and reasonably foreseeable projects, Alternatives B through F would result in **negligible** adverse cumulative impacts to air quality due to accidental releases.
				Onshore: Inadvertent spills in onshore waters during construction, such as the release of fuels and oils from vehicles or infrastructure, which would disperse rapidly, would be classified as routine and would be localized, short term, and minor (BOEM 2015). Therefore,

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
				negligible adverse impacts to air quality from onshore spills are anticipated from the Proposed Action during construction and installation and O&M. The Proposed Action when combined with past, present, and other reasonably foreseeable projects would also result in short-term and **negligible** adverse cumulative impacts on air quality. Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** adverse.
Air emissions: Construction and decommissioning	Air emissions originate from combustion engines and electric power generated by burning fuel. These activities are regulated under the CAA to meet set standards. Air quality has generally improved over the last 35 years; however, some areas in the Northeast have experienced a decline in air quality over the last 2 years. Some areas of the Atlantic coast remain in nonattainment for O_3, with the source of this pollution from power generation. Many of these states have made commitments toward cleaner energy goals to improve this, and offshore wind is part of these goals. Primary processes and activities that could affect the air quality impacts are expansions and modifications to existing fossil fuel power plants, onshore and offshore activities involving renewable energy facilities, and various construction activities.	The largest air quality impacts over the next 35 years would occur during the construction phase of any one project; however, projects would be required to comply with the CAA. During the limited construction and decommissioning phases, emissions could occur that are above de minimis thresholds and would require offsets and mitigation. Primary emission sources would be due to increased commercial vehicular traffic, air traffic, public vehicular traffic, and combustion emissions from construction equipment as well as fugitive emissions from construction-generated dust. As projects come online, power generation emissions overall would decline, and the industry as a whole would have a net benefit on air quality.	See Section 3.4.1.1 for analysis.	See Sections 3.4.2.2 and 3.4.2.3 for analysis.
Air emissions: O&M		Activities associated with O&M of onshore wind projects would have a proportionally very small contribution to emissions compared to construction and decommissioning activities over the next 35 years. Emissions would largely be due to commercial vehicular traffic and operation of emergency diesel generators. Such activity would result in short-term, intermittent, and widely dispersed emissions and small air quality impacts.	See Section 3.4.1.1 for analysis.	See Sections 3.4.2.2 and 3.4.2.3 for analysis.
Air emissions: Power generation emissions reductions		Many Atlantic states have committed to clean energy goals, with offshore wind playing a large role. Other reductions include transitioning to onshore wind and solar. The No Action Alternative without implementation of other future offshore wind projects could result in increased air quality impacts regionally due to the need to construct and operate new energy generation facilities to meet future power demands. Unless substituted by other, non–offshore wind sources, these facilities could consist of new natural gas–fired power plants or coal-fired, oil-fired, or clean coal–fired plants. These types of facilities would likely have larger and	See Section 3.4.1.1 for analysis.	See Sections 3.4.2.2 and 3.4.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
		continuous emissions and result in greater regional-scale impacts on air quality.		
Climate change	The construction and installation, O&M, and decommissioning of offshore wind projects would produce GHG emissions (nearly all CO_2) that can contribute to climate change; however, these contributions would be minuscule compared to aggregate global emissions. CO_2 is relatively stable in the atmosphere and generally mixed uniformly throughout the troposphere and stratosphere. Hence, the impact of GHG emissions does not depend upon the source location. Increasing energy production from offshore wind projects would likely decrease GHG emissions by replacing energy from fossil fuels.	Development of future onshore wind projects would produce a small overall increase in GHG emissions over the next 35 years. However, these contributions would be very small compared to the aggregate global emissions. The impact on climate change from these activities would be very small. As more projects come online, some reduction in GHG emissions would be expected from modifications of existing fossil fuel facilities to reduce power generation. Overall, it is anticipated that there would be no cumulative impact on global warming as a result of onshore wind project activities.	See Section 3.4.1.1 for analysis.	See Sections 3.4.2.2 and 3.4.2.3 for analysis.

Bats

Table E1-2. Summary of Activities and the Associated Impact-Producing Factors for Bats

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded and would result in high-intensity, low-exposure-level long-term but localized intermittent risk to bats in nearshore waters. Direct impacts are not expected to occur as recent research has shown that bats could be less sensitive to temporary threshold shifts than other terrestrial mammals (Simmons et al. 2016). Indirect impacts (i.e., displacement from potentially suitable habitats) could occur as a result of construction activities, which could generate noise sufficient to cause avoidance behavior (Schaub et al. 2008). Construction activity would be temporary and highly localized.	Similar to ongoing activities, noise associated with pile-driving activities would be limited to nearshore waters, and these high-intensity but low-exposure risks would not be expected to result in direct impacts. Some indirect impacts (i.e., displacement from potentially suitable foraging habitats) could occur as a result of construction activities, which could generate noise sufficient to cause avoidance behavior (Schaub et al. 2008). Construction activity would be temporary and highly localized, and no population-level effects would be expected.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis during offshore activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Noise: Onshore Construction	Onshore construction occurs regularly for generic infrastructure projects in the bats geographic analysis area. There is a potential for displacement caused by equipment if construction occurs at night (Schaub et al. 2008). Any displacement would only be temporary. No individual or population-level impacts would be expected. Some bats roosting in the vicinity of construction activities could be disturbed during construction but would be expected to move to a different roost farther from construction noise. This behavior would not be expected to result in any impacts as frequent roost switching is a common component of a bat's life history (Hann et al. 2017; Whitaker 1998).	Onshore construction is expected to continue at current trends. Some behavioral responses and avoidance of construction areas could occur (Schaub et al. 2008). However, no injury or mortality would be expected.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis during onshore activities.
Presence of structures: Migration disturbances	There could be few structures scattered throughout the offshore bats geographic analysis area, such as navigation and weather buoys and light towers (NOAA 2020a). Migrating bats can easily fly around or over these sparsely distributed structures, and no migration disturbance would be expected. Bat use of offshore areas is very limited and generally restricted to spring and fall migration. Very few bats would be expected to encounter structures on the OCS, and no population-level effects would be expected.	The infrequent installation of future new structures in the marine environment of the next 35 years is expected to continue. As described under Ongoing Activities, These structures would not be expected to cause disturbance to migrating tree bats in the marine environment.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis.
Presence of structures: Turbine strikes	There could be few structures in the offshore bats geographic analysis area, such as navigation and weather buoys, turbines, and light towers (NOAA 2020a). Migrating tree bats can easily fly around or over these sparsely distributed structures, and no strikes would be expected.	The infrequent installation of future new structures in the marine environment of the next 35 years is expected to continue. As described to the left under Ongoing Activities, these structures would not be expected to result in increased collision risk to migrating tree bats in the marine environment.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis.
New cable emplacement/maintenance	Cable emplacement and maintenance activities are expected to continue to follow current trends. Potential direct effects on individuals could occur if these activities include tree removal when bats are potentially present. Injury or mortality could occur if trees being removed are occupied by bats at the time of removal. While there is some potential for indirect impacts associated with habitat loss, no individual or population-level effects would be expected.	Future non–offshore wind development would continue to occur at the current rate. This development has the potential to result in habitat loss and could result in injury or mortality of individuals.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis during onshore activities.
Light: Vessels	Ocean vessels have an array of lights, including navigational lights, deck lights, and interior lights. Bats could demonstrate attraction to or avoidance of construction vessels installing offshore facilities, particularly if insects (i.e., prey) are drawn to the lights of the vessels. The impact is localized and temporary. This attraction would not be expected to result in an increased risk of collision with vessels. Population-level impacts would not be expected.	No future activities were identified within the bats geographic analysis area other than ongoing activities.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Light: Structures	Buoys, towers, and onshore structures with lights could attract bats. Onshore structures like houses and ports emit a great deal more light than offshore buoys and towers. This attraction has the potential to result in an increased risk of collision with lighted structures (Hüppop et al. 2006). Light from structures is widespread and permanent near the coast but minimal offshore.	Light from onshore structures is expected to gradually increase in proportion with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.5.1.1 for analysis.	See Sections 3.5.2.2 and 3.5.2.3 for analysis.
Climate change: Warming and sea level rise, storm severity/frequency	Storms during breeding and roosting season could reduce productivity and increase mortality. Intensity of this impact is speculative.	No future activities were identified within the bats geographic analysis area other than ongoing activities.		Climate change, including increased storm severity/frequency and increased disease frequency, could impact bats. However, the intensity and extent of these potential impacts are speculative at this time; therefore, climate change is not discussed further in the context of potential impacts to bats.
Climate change: Warming and sea level rise, increased disease frequency	Disease can weaken, lower reproductive output, and/or kill individuals. Some tropical diseases would move northward. Extent and intensity of this impact is highly speculative.	No future activities were identified within the bats geographic analysis area other than ongoing activities.		Climate change, including increased storm severity/frequency and increased disease frequency, could impact bats. However, the intensity and extent of these potential impacts are speculative at this time; therefore, climate change is not discussed further in the context of potential impacts to bats.

Birds

Table E1-3. Summary of Activities and the Associated Impact-Producing Factors for Birds

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Ingestion of hydrocarbons can lead to morbidity and mortality due to decreased hematological function, dehydration, drowning, hypothermia, starvation, and weight loss (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Additionally, even small exposures that result in feather oiling can lead to sublethal effects that include changes in flight efficiencies and result in increased energy expenditure during daily and seasonal activities, including chick provisioning, commuting, courtship, foraging, long-distance migration, predator evasion, and territory defense (Maggini et al. 2017). These impacts rarely result in population-level impacts.	See Table E1-4 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the potential risk of accidental releases and associated impacts, including mortality, decreased fitness, and health effects on individuals. Impacts are unlikely to affect populations.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
Accidental releases: Trash and debris	Trash and debris are accidentally discharged through onshore sources; fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation, navigation, and traffic; survey activities; and cable, line, and pipeline laying on an ongoing basis. In a study from 2010, students at sea collected more	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris could increase. This could result in increased injury or mortality of individuals. However, there does not appear	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
	than 520,000 bits of plastic debris per square mile. In addition, many fragments come from consumer products blown out of landfills or tossed out as litter. (Law et al. 2010). Birds could accidentally ingest trash mistaken for prey. Mortality is typically a result of blockages caused by both hard and soft plastic debris (Roman et al. 2019).	to be evidence that the volumes and extents would have any impact on bird populations.		
Light: Vessels	Ocean vessels have an array of lights, including navigational lights, deck lights, and interior lights. Such lights can attract some birds. The impact is localized and temporary. This attraction would not be expected to result in an increased risk of collision with vessels. Population-level impacts would not be expected.	Gradually increasing vessel traffic over the next 35 years would increase the potential for bird and vessel interactions. While birds could be attracted to vessel lights, this attraction would not be expected to result in increased risk of collision with vessels. No population-level impacts would be expected.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Light: Structures	Buoys, towers, and onshore structures with lights can attract birds. Onshore structures like houses and ports emit a great deal more light than offshore buoys and towers. This attraction has the potential to result in an increased risk of collision with lighted structures (Hüppop et al. 2006). Light from structures is widespread and permanent near the coast but minimal offshore.	Light from onshore structures is expected to gradually increase in proportion with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
New cable emplacement/ maintenance	Cable emplacement and maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances would be temporary and generally limited to the emplacement corridor. Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be temporary and limited to the emplacement corridor. Suspended sediment could impair the vision of diving birds that are foraging in the water column (Cook and Burton 2010). However, given the localized nature of the potential impacts, individuals would be expected to successfully forage in nearby areas not affected by increased sedimentation, and no biologically significant impacts on individuals or populations would be expected.	Future new cables, would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in localized, short-term impacts. Impacts would be temporary and localized, with no biologically significant impacts on individuals or populations.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
Noise: Aircraft	Aircraft routinely travel in the geographic analysis area for birds. With the possible exception of rescue operations and survey aircraft, no ongoing aircraft flights would occur at altitudes that would elicit a response from birds. If flights are at a sufficiently low altitude, birds could flush, resulting in nonbiologically significant increased energy expenditure. Disturbance, if any, would be localized and temporary, and impacts would be expected to dissipate once the aircraft has left the area.	Aircraft noise is likely to continue to increase as commercial air traffic increases; however, very few flights would be expected to be at a sufficiently low altitude to elicit a response from birds. If flights are at a sufficiently low altitude, birds could flush, resulting in nonbiologically significant increased energy expenditure. Disturbance, if any, would be localized and temporary and impacts would be expected to dissipate once the aircraft has left the area.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity impulsive noise around	Same as ongoing activities, with the addition of possible future oil and gas surveys.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
	sites of investigation. These activities could result in diving birds leaving the local area. Non-diving birds would be unaffected. Any displacement would only be temporary during non-migratory periods, but impacts could be greater if displacement were to occur in preferred feeding areas during seasonal migration periods.			
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water could result in intermittent, temporary, localized impacts on diving birds due to displacement from foraging areas if birds are present in the vicinity of pile-driving activity. The extent of these impacts depends on pile size, hammer energy, and local acoustic conditions. No biologically significant impacts on individuals or populations would be expected.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Noise: Onshore construction	Onshore construction is routinely used in generic infrastructure projects. Equipment could cause displacement. Any displacement would only be temporary, and no individual fitness or population-level impacts would be expected.	Onshore construction would continue at current trends. Some behavior responses could range from escape behavior to mild annoyance, but no individual injury or mortality would be expected.	See Section 3.7.1.1 for analysis during onshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during onshore activities.
Noise: Vessels	Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Sub-surface noise from vessels could disturb diving birds foraging for prey below the surface. The consequence to birds would be similar to noise from G&G but likely less because noise levels are lower.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Presence of structures: Entanglement, gear loss, gear damage	Each year, 2,551 seabirds die annually from interactions with U.S. commercial fisheries on the Atlantic (Sigourney et al. 2019). Even more die due to abandoned commercial fishing gear (nets). In addition, recreational fishing gear (hooks and lines) is periodically lost on existing buoys, pilings, hard protection, and other structures and has the potential to entangle birds.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various hard protections atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these objects. These impacts are local and can be short term to permanent. These fish aggregations can provide localized, short-term to permanent beneficial impacts to some bird species because they could increase prey species availability.	New cables, installed incrementally in the geographic analysis area for birds over the next 20 to 35 years would likely require hard protection atop portions of the cables (see New cable emplacement/maintenance row above). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat seascape. Structure-oriented fishes could be attracted to these locations. Abundance of certain fishes could increase. These impacts are expected to be local and could be short term to permanent. These fish aggregations can provide localized short-term to permanent beneficial impacts on	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
		some bird species due to increased prey species availability.		
Presence of structures: Migration disturbances	A few structures could be scattered about the offshore geographic analysis area for birds, such as navigation and weather buoys and light towers (NOAA 2020a). Migrating birds could easily fly around or over these sparsely distributed structures.	The infrequent installation of future new structures in the marine or onshore environment over the next 35 years would not be expected to result in migration disturbances.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Presence of structures: Turbine strikes, displacement, and attraction	A few structures could be in the offshore geographic analysis area for birds, such as navigation and weather buoys, turbines, and light towers (NOAA 2020a). Given the limited number of structures currently in the geographic analysis area, individual and population-level impacts due to displacement from current foraging habitat would not be expected. Stationary structures in the offshore environment would not be expected to pose a collision risk to birds. Some birds like cormorants and gulls could be attracted to these structures and opportunistically roost on these structures.	The installation of future new structures in the marine or onshore environment over the next 35 years would not be expected to result in an increase in collision risk or displacement. Some potential for attraction and opportunistic roosting exists but would be expected to be limited given the anticipated number of structures.	See Section 3.7.1.1 for analysis during offshore activities.	See Sections 3.7.2.2 and 3.7.2.3 for analysis during offshore activities.
Traffic	General aviation accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2019). Additionally, aircraft are used for scientific and academic surveys in marine environments.	Bird fatalities associated with general aviation would be expected to increase and follow the current trend in commercial air travel. Aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. These flights would be well below 100,000 flights, and no bird strikes would be expected to occur.	Aircraft flying at low altitudes and vehicle traffic could cause birds to flush, resulting in increased energy expenditure. Disturbance to birds, if any, would be temporary and localized, with impacts dissipating once the aircraft has left the area. General aircraft traffic accounts for approximately two bird strikes per 100,000 flights (Dolbeer et al. 2019). Because aircraft flights associated with offshore wind development would be minimal in comparison to baseline conditions, aircraft strikes with birds are rare. For this reason, aircraft traffic would not be expected to contribute to overall impacts on birds and as a result, BOEM expects no measurable impacts to birds from aircraft traffic. Planned future offshore projects, specifically wind projects, would result in increased short-term construction vessel traffic and long-term maintenance vessel traffic. Some of the vessel traffic from planned future projects would use designated shipping channels. Vessel traffic could cause seabirds to flush, resulting in temporary habitat loss (Schwemmer et al. 2011). Avoidance of shipping channels could result in long-term habitat loss and fragmentation; however, these adverse impacts would be short-term **negligible** as birds would become habituated to channeled traffic.	**Offshore:** Helicopters could be used for crew changes and construction support during installation of the WTGs; however, their use would be infrequent and used during foundation construction (see COP Appendix T [Tech Environmental 2021]). Vessel traffic associated with construction activities could flush birds in the path of vessels, causing temporary displacement from the area; however, impacts would be temporary and similar to baseline conditions because vessel traffic already occurs, resulting in similar temporary displacement of birds in the geographic analysis area (Stantec 2018). The expected adverse impacts of aircraft and vessel traffic associated with the Proposed Action alone would not increase the impacts of this IPF beyond the impacts described under the No Action Alternative. Alternatives C through F would reduce the number of WTGs installed, potentially resulting in a reduced number of helicopter trips and vessel traffic required during construction. However, no measurable change from Proposed Action construction impacts to birds from this IPF is anticipated. Therefore, impacts under Alternatives B through F are expected to be short term **negligible** adverse. A hoist-equipped helicopter could be used to support O&M of the RWF; however, helicopter use would be infrequent (see COP Appendix T [Tech Environmental 2021]). Increases in vessel traffic during maintenance activities would be limited and infrequent. The expected adverse impacts to birds from aircraft and vessel traffic associated with Alternatives B through F alone would not increase the impacts of this IPF beyond the impacts

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
				described under the No Action Alternative: short term **negligible** adverse. Aircraft flights associated with Project activities would be infrequent, and aircraft strikes with birds would be rare. Aircraft flights associated with other past, present, and reasonably foreseeable activities passing through the Lease Area would be minimal and infrequent. Vessel traffic could cause birds to flush, resulting in a temporary loss of habitat during construction activities associated with all Project alternatives. Impacts could be greater if avoidance and displacement of birds occur during seasonal migration periods. However, impacts would be temporary and similar to baseline conditions because vessel traffic already occurs in the geographic analysis area (Stantec 2018) and birds are habituated to regularly used shipping channels. In the context of reasonably foreseeable environmental trends, the combined aircraft and vessel traffic impacts from ongoing and planned actions, including Alternatives B through F, would be similar to the impacts under the No Action Alternative: long term **negligible** adverse.
				Onshore: Aircraft traffic would not have an onshore impact on birds. Therefore, impacts would be **negligible** adverse under all alternatives.
Climate change: Warming and sea level rise, storm severity/frequency, altered habitat/ecology	Increased storm frequency and severity during the breeding season can reduce productivity of bird nesting colonies and kill adults, eggs, and chicks. Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters over the next 30 years, influencing the distribution of bird prey resources.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
Climate change: Ocean acidification	Increasing ocean acidification could affect prey species upon which some birds feed and could lead to shifts in prey distribution and abundance. Intensity of impacts on birds is speculative.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.
Climate change: Warming and sea level rise, altered migration patterns	Birds rely on cues from the weather to start migration. Wind direction and speed influence the amount of energy used during migration. For nocturnal migrants, wind assistance is projected to increase across eastern portions of the continent (0.32 m/s; 9.6%) during spring migration by 2091, and wind assistance is projected to decrease within eastern portions of the continent (0.17 m/s; 6.6%) during autumn migration (La Sorte et al. 2018).	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/ Extent	Action Alternatives B through F
Climate change: Warming and sea level rise, increased disease frequency	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters over the next 35 years, influencing the frequencies and distributions of various diseases of birds.	No future activities were identified within the geographic analysis area for birds other than ongoing activities.	See Section 3.7.1.1 for analysis.	See Sections 3.7.2.2 and 3.7.2.3 for analysis.

Water Quality

No IPFs with solely negligible impacts were identified.

Table E1-4. Summary of Activities and the Associated Impact-Producing Factors for Water Quality

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/ hazmat	Accidental releases of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable, line, and pipeline laying activities. According to the Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution Federation Limited (2021), which collects data on oil spills from tankers and other sources. From 1990 to 1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and into the offshore was < 70,000 barrels. Impacts on water quality would be expected to brief and localized from accidental releases.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities. Impacts are unlikely to affect water quality.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.
Accidental releases: Trash and debris	Trash and debris could be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities, and cable, line, and pipeline laying. Accidental releases of trash and debris are expected to be low probability events. BOEM assumes operator compliance with federal and international requirements for management of shipboard trash; such events also have a relatively limited spatial impact.	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris could increase. However, there does not appear to be evidence that the volumes and extents anticipated would have any effect on water quality.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Anchoring	Impacts from anchoring occur due to ongoing military use and survey, commercial, and recreational activities.	Impacts from anchoring could occur semiregularly over the next 35 years due to offshore military operations or survey activities. These impacts would include increased seafloor disturbance resulting in increased turbidity levels. All impacts would be localized, short term, and temporary.	See Section 3.21.1.1.1 for analysis within offshore waters. Anchoring would not impact onshore waters.	See Sections 3.21.2.2 and 3.21.2.3 for analysis within offshore waters. Anchoring would not impact onshore waters.
New cable emplacement/ maintenance	Elevated suspended sediment concentrations can occur under natural tidal conditions and increase during storms, trawling, and vessel propulsion. Survey activities and new cable and pipeline laying activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances would be short term and either be limited to the emplacement corridor or localized.	Suspension of sediments could continue to occur infrequently over the next 35 years due to survey activities and submarine cable, line, and pipeline-laying activities. Future new cables would occasionally disturb the seafloor and cause short-term increases in turbidity and minor alterations in localized currents resulting in local short-term impacts. The FCC has two pending submarine telecommunication cable applications in the North Atlantic. If the cable routes enter the water quality geographic analysis area, short-term disturbance in the form of increased suspended sediment and turbidity would be expected.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.
Port utilization: Expansion	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity would increase modestly. The ability of ports to receive the increase in larger ships would require port modifications, which, along with additional vessel traffic, could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. The increased sediment suspension could be long term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future.	The general trend along the coastal region from Virginia to Maine is that port activity would increase modestly over the next 35 years. Port modifications and channel-deepening activities are being undertaken to accommodate the increase in vessel traffic and deeper draft vessels that transit the Panama Canal locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.
Presence of structures	The installation of onshore and offshore structures leads to alteration of local water currents. These disturbances would be local but, depending on the hydrologic conditions, have the potential to impact water quality through the formation of sediment plumes.	Impacts associated with the presence of structures includes temporary sediment disturbance during maintenance. This sediment suspension would lead to interim and localized impacts.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Discharges	Discharges impact water quality by introducing nutrients, chemicals, and sediments to the water. There are regulatory requirements related to prevention and control of discharges, the prevention and control of accidental spills, and the prevention and control of nonindigenous species.	Increased coastal development is causing increased nutrient pollution in communities. In addition, ocean disposal activity in the North Atlantic and Mid-Atlantic is expected to gradually decrease or remain stable. Impacts of ocean disposal on water quality are minimized because the EPA has established dredge spoil criteria and regulate the disposal permits issued by the USACE. The impact on water quality from sediment suspension during these future activities would be short term and localized.	See Sections 3.21.1.1.1 and 3.21.1.2.1 for analysis.	See Sections 3.21.2.2 and 3.21.2.3 for analysis.

Coastal Habitats and Fauna

Table E2-1. **Summary of Activities and the Associated Impact-Producing Factors for Coastal Habitats and Fauna**

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
New cable emplacement/ maintenance	Onshore buried transmission cables are present in the area near the Project onshore and offshore improvements. Onshore activities would only occur where permitted by local land use authorities, which would avoid long-term land use conflicts. Continual development of residential, commercial, industrial, solar, transmission, gas pipeline, onshore wind turbine, transportation infrastructure, sewer infrastructure, and cell tower projects could permanently convert various areas.	No known proposed onshore structures are reasonably foreseeable and proposed to be located in the geographic analysis area for coastal habitats and fauna.	A small amount of infrequent construction impacts associated with onshore power infrastructure would be required over the next 6 to 10 years to tie future offshore wind energy projects to the electric grid. Typically, this would require only small, if any, amounts of coastal habitat removal and would likely occur in previously disturbed areas. Habitat loss occurs when an area supporting wildlife is converted to non-habitat that lacks the natural resources to support occupancy for any species, such as paved areas. Short-term and temporary impacts associated with habitat loss or avoidance during construction could occur, and injury or mortality of individuals could occur. For this reason, land disturbance associated with onshore construction activities would have a **negligible** contribution to overall adverse impacts on coastal habitats and fauna.	**Onshore**: During construction of the onshore transmission cable and associated activities within the landfall work area, land disturbance could result in small temporary impacts (e.g., displacement and potential injury and/or mortality of individuals) on coastal fauna. Land disturbance and subsequent habitat removal or alteration could result from the RWEC connection to the landfall work area and construction of the onshore transmission cable. Potential indirect impacts to coastal habitats would include the spread of invasive species, reduction in habitat quality, and displacement of wildlife and resources based on changes to habitat conditions. The potential for onshore construction and habitat alteration to significantly affect coastal habitat is limited because the landfall work area consists of areas of predominately human-made shoreline and grassland/shrubland areas as a result of previous human activity. Habitat conversion is not a factor for developed areas (e.g., existing buildings, mowed lawns, parking lots, roads) within the landfall envelope. The construction period for the onshore facilities would occur over approximately 18 months, and the infrastructure at the landfall work area would be placed underground when completed. HDD would be employed to connect the RWEC and the landfall work area. This would limit or completely avoid direct impacts to the human-made shoreline and ruderal grassland/shrubland because the RWEC would be installed under these resources. The temporary onshore

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				construction work area for the HDD operations would likely be situated within a previously developed area (e.g., an existing parking lot) and would not impact the human-made shoreline and/or the ruderal grassland/shrubland. However, if these habitat types are disturbed, these impacts would be short term because the area would be reseeded to re-establish previous conditions. The human-made shoreline does not support any vegetative growth. A potential indirect impact to coastal habitat from onshore construction and habitat alteration linked to construction of the landfall work area is habitat degradation via the spread of invasive species. If vegetative clearing is required within the ruderal grassland/shrubland for construction of the landfall work area, then this could provide an opportunity for invasive plant species to outcompete native plants. The baseline conditions of the ruderal grassland/shrubland habitat already support a high occurrence of invasive plant species. Habitats with high levels of invasive species can degrade habitat quality for wildlife by reducing the amount of native plant material available for foraging. However, this area of undisturbed habitat is so small it is unlikely to provide a significant habitat resource to wildlife. The spread of invasive species would be managed in compliance with state and federal regulations. Impacts to coastal habitats and fauna from construction activities at the landfall work area would be considered short-term **negligible** adverse for Alternatives B through F. As noted within the landfall work area impact assessment, wildlife species subject to direct mortality during construction of the onshore facilities are those with limited or no mobility. Onshore transmission cable installation would result in temporary ground disturbance, but permanent disturbances are not anticipated. Most of the temporary ground disturbance would be from a trench that would follow along paved roads or previously disturbed areas (e.g., parking lots) except for a small portion that intersects approximately 0.02 acre of plantation and ruderal forest. The onshore transmission cable would be up to 1 mile long with a maximum temporary disturbance corridor of 25 feet (30 feet at splice vaults) and a maximum disturbance depth of 10 feet that would be mostly limited to established road ROWs or previously disturbed areas such as parking lots with little to no impact to adjacent coastal and terrestrial habitat. Where the onshore transmission cable would connect to the OnSS, it would be installed below a proposed access driveway. Some of the alternative routes under consideration within the

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				transmission cable envelope contain segments that would pass through undeveloped, vegetated areas. If selected, these routes would require vegetative clearing and would be maintained as managed lawn and or gravel access road to maintain access to the cable infrastructure belowground. Since these segments of the onshore transmission cable routes under consideration would be installed within previously undeveloped areas, the impacts resulting from habitat alteration and conversion would be considered long term and **negligible**. Regular O&M activities would not cause further habitat alteration or impact coastal habitats and fauna. However, when cable inspection or repairs require excavation, this nonroutine maintenance could cause limited land disturbance to create access to the infrastructure. Such occurrences are expected to be infrequent and would result in localized and short-term **negligible** adverse impacts to coastal habitats and fauna for Alternatives B through F. Decommissioning of the onshore transmission cable would have similar impacts on coastal habitats and fauna to those described for the construction phase if the underground infrastructure is removed. If the infrastructure is abandoned in place, it would not have any impacts. Construction and installation, O&M, and decommissioning of the onshore transmission cable under all Project alternatives would incrementally contribute to the habitat conversion and habitat loss described under the No Action Alternative. Because of the small amount of affected onshore habitat, land disturbance from Alternatives B through F when added to other past, present, and reasonably foreseeable projects would result in **negligible** adverse incremental impacts to coastal habitats and fauna.
Presence of structures	Periodic clearing of shrubs and tree saplings along existing utility ROWs causes disturbance and temporary displacement of mobile species and could cause direct injury or mortality of less mobile species, resulting in short-term impacts that are less than noticeable. Continual development of residential, commercial, industrial, solar, transmission, gas pipeline, onshore wind turbine, and cell tower projects also causes disturbance, displacement, and potential injury and/or mortality of fauna, resulting in small temporary impacts.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.8.1.1 for analysis.	See Sections 3.8.2.2 and 3.8.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.
Noise: Onshore/offshore construction	Ongoing noise from construction occurs frequently near shores of populated areas in New England and the mid-Atlantic region but infrequently offshore. Noise from construction near shorelines is expected to gradually	No future activities were identified within the geographic analysis area other than ongoing activities.	Onshore construction noise has the potential to have a **negligible** adverse impact on coastal fauna. BOEM anticipates that these impacts would be temporary and highly localized. Habitat-related impacts (i.e.,	**Onshore:** Another potential indirect impact to coastal fauna during construction of the onshore facilities is displacement or avoidance behavior of individuals due to noise. The overall installation schedule for onshore

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	increase over the next 30 years, in line with human population growth along the coast of the geographic analysis area. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary.		displacement from potentially suitable habitats) could occur as a result of construction activities. These impacts would likely be limited to temporary behavioral avoidance, and no permanent impacts would be expected. Given the temporary and localized nature of potential impacts, and the current level of development within the geographic analysis area, no individual fitness or population-level impacts would occur as a result of noise associated with onshore construction activities.	facilities is expected to be approximately 1 year (see COP Section 3.2, Project Schedule). Construction would typically result in temporary increases in noise. As described in vhb's onshore acoustic assessment (vhb 2020), noise was evaluated based generally on the noisiest condition when the loudest construction equipment would be in operation. The primary noise sources generated during construction would be from increased traffic volumes (i.e., delivery trucks carrying construction equipment and supplies and automobiles used for daily commuting to various work sites) and HDD at the landfall work area. Sound-generating construction equipment associated with HDD operations would include a drill rig, a generator, and mud pumps. Unlike most other construction activities that can be limited to daytime hours, it is typically necessary for HDD operations to occur continuously to minimize the risk of soil settlement and equipment failures. Other noise-generating equipment used during HDD operations would include an excavator, a crane, and either an impact or vibratory sheet pile driver for site preparation. The onshore acoustic assessment (vhb 2020) indicates that construction equipment used to support construction of the landfall work area could create sound levels that range from 56 to 101 dBA at 50 feet from the noise source. Ambient sound measurements conducted within the analysis area under existing conditions ranged from 44 to 45 dBA (Leq) at night and 49 to 50 dBA during the day (vhb 2020). Construction of the onshore transmission cable would involve different construction phases, each using noise-generating equipment such as bulldozers, backhoes, front-end loaders, aerial lifts, trenchers, compactors, concrete saws, graders, pumps, compressors, and trucks. Because the onshore transmission cable installation process would progress along the cable route during this period, the exposure to construction noise would be limited to a discrete duration at any location along the route. The onshore acoustic assessment (vhb 2020) indicates that construction equipment used to support construction of the onshore transmission cable could create sound levels that range from 73 to 90 dBA at 50 feet from the noise source depending on the installation methodology. The sequence for construction of the OnSS and ICF would typically include clearing the site of vegetation, grading the site, installing environmental erosion controls, installing the foundations and erecting buildings for housing equipment, and restoring any disturbed areas on the site and removing environmental controls. The types of construction equipment used would generally include

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				backhoes, cranes, refrigerator units, front-end loaders, and generators. The onshore acoustic assessment (vhb 2020) indicates that construction equipment used to support construction of the OnSS could create sound levels that range from 80 to 85 dBA at 50 feet from the noise source. Potential impacts to coastal fauna from the temporary increase in construction-generated noise could include avoidance behavior and displacement during the construction period (Brown et al. 2012). Because the construction period is temporary, noise impacts on wildlife species during construction of the onshore facilities of Alternatives B through F are expected to be temporary negligible adverse. No impacts related to noise would be expected from operation of the onshore transmission cable because the infrastructure would be underground. However, when cable inspection or repairs require excavation, this non-routine maintenance could generate equipment- and vehicle-related noise. Such occurrences are expected to be infrequent and would result in localized and short-term negligible adverse impacts to coastal habitats and fauna. Decommissioning of the onshore transmission cable would have similar impacts from noise on coastal habitats and fauna to those described for the construction phase if the underground infrastructure is removed. If the infrastructure is abandoned in place, it would not have any impacts. O&M at the proposed OnSS and ICF would introduce new sources of sound, including transformers, shunt reactors, harmonic filters, cooling and ventilation associated with the outdoor substation equipment as well as condensers, pumps, skids, and auxiliary transformers associated with the synchronous condenser building. Operational sound from the OnSS and ICF is modeled to be 45.5 dBA (Leq) or less when measured at the nearest anthropogenic noise sensitive receivers, which would fall within the ambient sound range measured at baseline conditions (44 to 45 dBA (Leq) at night and 49 to 50 dBA during the day) (vhb 2020), and no impacts to coastal fauna are expected. Temporary noise could occasionally be generated during non-routine maintenance at all onshore facilities. Infrequent vehicle usage within the OnSS and ICF could create temporary disturbance to wildlife adjacent to the OnSS, but such disturbance would be short term, and normal wildlife activity would likely resume after the traffic ceases. Impacts from noise during decommissioning of onshore facilities would be similar to those during

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				construction: temporary negligible adverse for all Project alternatives. Construction, O&M, and decommissioning of the onshore facilities would also produce temporary noise that would lead to short-term negligible incremental impacts, if any, on coastal habitats and fauna. The onshore elements of Alternatives B through F would be in already developed areas with existing noise disturbance where wildlife is habituated to human activity. Therefore, the cumulative impact of noise generated by Alternatives B through F on coastal habitats and fauna when combined with past, present, and reasonably foreseeable projects would be localized and short term **negligible** adverse.
Climate change: Warming and sea level rise, altered habitat/ecology	Climate change, influenced in part by GHG emissions, is altering the seasonal timing and patterns of species distributions and ecological relationships, likely causing permanent changes of unknown intensity gradually over the next 35 years.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.8.1.1 for analysis.	See Sections 3.8.2.2 and 3.8.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.

Wetlands and Other Waters of the United States

Table E2-2. Summary of Activities and the Associated Impact-Producing Factors for Wetlands and Other Waters of the United States

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	Ongoing onshore construction projects involve vehicles and equipment that use fuel, fluids, or hazardous materials could result in an accidental release. Intensity and extent would vary, depending on the size, location, and materials involved in the release.	No future activities were identified within the geographic analysis area for wetlands and other WOTUS other than ongoing activities.	See Section 3.22.1.1 for analysis.	See Sections 3.22.2.2 and 3.22.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.
Accidental releases: Trash and debris	Ongoing releases of trash and debris occur from onshore sources; fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey activities; and cable, line, and pipeline laying.	No future activities were identified within the geographic analysis area for wetlands and other WOTUS other than ongoing activities.	See Section 3.22.1.1 for analysis.	See Sections 3.22.2.2 and 3.22.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.
Discharges	Discharges impact water quality by introducing nutrients, chemicals, and sediments to the water. There are regulatory requirements related to the prevention and control of discharges, the prevention and control of accidental spills, and the prevention and control of nonindigenous species.	Increased future coastal development has potential to cause increased nutrient pollution in communities, approximately 80% of which is due to groundwater contamination by septic systems. In addition, ocean disposal activity in the North Atlantic is expected to gradually decrease or remain stable. Impacts of ocean disposal on water quality are minimized because the EPA has established dredge spoil criteria and regulates the disposal permits issued by the USACE.	See Section 3.22.1.1 for analysis.	See Sections 3.22.2.2 and 3.22.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
New cable emplacement/ maintenance	No known proposed cables are reasonably foreseeable and proposed to be located in the geographic analysis area for wetlands and other waters of the United States.	Any new cable or pipeline installed in the geographic analysis area would likely require hard protection atop portions of the route. Such protection is anticipated to increase incrementally over the next 30 years.	See Section 3.22.1.1 for analysis.	See Sections 3.22.2.2 and 3.22.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.
Presence of structures	Ongoing development of onshore properties, especially shoreline parcels, periodically could lead to unvegetated or otherwise unstable soils. Precipitation events could potentially mobilize the soils into nearby surface waters, leading to potential erosion and sedimentation effects and subsequent increased turbidity. No known proposed structures are reasonably foreseeable and proposed to be located in the geographic analysis area for wetlands and other WOTUS.	Impacts associated with the presence of structures includes temporary sediment disturbance during maintenance and ongoing development. This sediment suspension would lead to short-term and localized impacts.	See Section 3.22.1.1 for analysis.	See Sections 3.22.2.2 and 3.22.2.3 for analysis of onshore impacts. The IPF would not impact offshore resources.
Sediment deposition and burial	Ongoing cable or structure maintenance activities can infrequently disturb sediments; these disturbances are local and limited to the emplacement corridor. Precipitation events could potentially mobilize the disturbed sediments into nearby surface waters, leading to potential erosion and sedimentation effects and subsequent increased turbidity.	No future activities were identified within the geographic analysis area other than ongoing activities.	Dredge materials from future offshore wind activities would not be disposed of in areas with wetlands or other WOTUS within the geographic analysis area. Therefore, **negligible** adverse impacts to wetlands and other WOTUS within the geographic analysis area are anticipated.	Dredge materials from Project activities would not be disposed of in areas with wetlands or other WOTUS. Therefore, sediment deposition and burial impacts on wetlands and other WOTUS from construction and installation would be the same for Alternatives B through F: **negligible** adverse. O&M of onshore O&M facilities could include dredging activities for Alternatives B through F; however, materials from O&M activities would not be disposed of in areas with wetlands or other WOTUS. Therefore, **negligible** adverse impacts to wetlands and other WOTUS from sediment deposition and burial are anticipated for all Project alternatives. Dredge materials from Alternatives B through F and other future offshore wind projects within the geographic analysis area would not be disposed of in areas with wetlands or other WOTUS. As a result, when combined with past, present, and reasonably foreseeable projects, Alternatives B through F are expected to result in **negligible** adverse impacts to wetlands and other WOTUS.
Climate change: Warming and sea level rise, altered habitat/ecology	Climate change, influenced in part by ongoing GHG emissions, is expected to continue to contribute to a widespread loss of shoreline habitat from rising seas and erosion. In submerged habitats, warming is altering ecological relationships and the distributions of ecosystem engineer species, likely causing permanent changes of unknown intensity gradually over the next 3 years.	No future activities were identified within the geographic analysis area other than ongoing activities.	Impacts of climate change, including increased storm severity and frequency, are ongoing stressors for wetlands and other WOTUS. Future offshore wind projects aim to combat climate change and associated effects by reducing GHG emissions. Under the No Action Alternative, the long-term net decrease in GHG emissions from other ongoing and future offshore wind and other non-fossil fuel–based energy generation projects would be slightly less than with the Proposed Action. As a result, the effects to wetlands and other WOTUS would be **negligible** to **minor** adverse, as they are anticipated to occur but have no measurable influence within the geographic analysis area.	Air pollutants could impact onshore biological resources, including wetlands and WOTUS. Acidification of soils, lakes, and streams could result in changes in community structure and biodiversity within these habitats. The OCS air permitting process will require air dispersion modeling of these emissions to demonstrate compliance with the NAAQS. Specifically, EPA requires modeling of NAAQS and Class I significant impact levels for the purpose of PSD permitting for the construction and operation of Revolution Wind. Compliance with the NAAQS offshore in and near the Lease Area will be evaluated with air quality dispersion modeling through EPAs OCS permitting. Because air emissions generated during the construction and installation period would not exceed applicable air

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				emission standards the impacts to onshore wetlands and other WOTUS would be short-term negligible adverse. Air emissions generated during O&M of onshore facilities would be less than 1% of the counties' annual emissions (see Section 3.4.2.2.2). While cumulative air emissions in the region would increase during construction, it is important to note that the Proposed Action could also contribute to a long-term net decrease in emissions by substituting some existing fossil fuel sources with a renewable source. Therefore, impacts to wetlands and other WOTUS are anticipated to be **negligible** adverse. The cumulative impacts from global climate change would be the same as those described for future offshore wind activities without the Proposed Action because emissions from other past, present, and reasonably foreseeable projects, in combination with air emissions generated during construction and O&M would not exceed applicable air emission standards. Thus, potential impacts to wetlands and other WOTUS from the incremental contribution to climate change attributed to the Proposed Action when combined with past, present, and other reasonably foreseeable projects are uncertain but are anticipated to qualify as long term **negligible** adverse. Alternatives C through F would have the same onshore activities and facilities as the Proposed Action; therefore, climate change impacts on wetlands and other WOTUS would be the same as those described for the Proposed Action: **negligible** adverse.

Benthic Habitat and Invertebrates

Table E2-3. **Summary of Activities and the Associated Impact-Producing Factors for Benthic Habitat and Invertebrates**

Associated IPFs: Sub-IFPs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a discussion of ongoing accidental releases. Accidental releases of hazmat occur periodically, mostly consisting of fuels, lubricating oils, and other petroleum compounds. Because most of these materials tend to float in seawater, they rarely contact benthic resources. The chemicals with potential to sink or dissolve rapidly often dilute to nontoxic levels before they affect benthic resources. The corresponding impacts on benthic resources are rarely noticeable. Impacts, including mortality and decreased fitness, are localized and temporary and rarely affect invertebrate populations.	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Impacts are unlikely to affect invertebrate populations. See previous table cell and Table E1-4 on water quality for details.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.3 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.

Associated IPFs: Sub-IFPs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Invasive species	Invasive species are periodically released accidentally during ongoing activities, including the discharge of ballast water and bilge water from marine vessels. The impacts on benthic resources (e.g., competitive disadvantage, smothering) depend on many factors but can be noticeable, widespread, and permanent.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.3 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Accidental releases: Trash and debris	Ongoing releases of trash and debris occurs from onshore sources; fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey activities; and cable, line, and pipeline laying. However, there does not appear to be evidence that ongoing releases have detectable impacts on benthic resources.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.3 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Anchoring	Regular vessel anchoring related to ongoing military, survey, commercial, and recreational activities continues to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor. These impacts include increased turbidity levels and the potential for direct contact to cause injury and mortality of benthic resources as well as physical damage to their habitats. These impacts are greatest for sessile or slow-moving species (e.g., corals, sponges, and sedentary shellfish). All impacts are localized; turbidity is temporary; injury and mortality are recovered in the short term; and physical damage can be permanent if it occurs in eelgrass beds or hard-bottom habitat.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Bycatch	Bycatch occurs in various gillnet and trawl fisheries in New England and the mid-Atlantic coast, with hotspots driven by fishing intensity (Lewison et al. 2014; NMFS 2018a).	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
EMFs	EMFs continuously emanate from existing telecommunication and electrical power transmission cables. New cables generating EMFs are infrequently installed in the geographic analysis area. Some benthic species can detect EMFs, although EMFs do not appear to present a barrier to movement. The extent of impacts (behavioral changes) is likely less than 50 feet (15.2 m) from the cable and the intensity of impacts on benthic resources is likely undetectable.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Light: Vessels	Marine vessels have an array of lights, including navigational lights and deck lights. There is little downward-focused lighting and therefore only a small fraction of the emitted light enters the water. Light can attract invertebrates, potentially affecting distributions in	See table cell to the left.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no

Associated IPFs: Sub-IFPs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	a highly localized area. Light could also disrupt natural cycles (e.g., spawning), possibly leading to short-term impacts.		measurable effect on benthic habitat or invertebrates and are not analyzed.	measurable effect on benthic habitat or invertebrates and are not analyzed.
Light: Structures	Offshore buoys and towers emit light, and onshore structures, including buildings and ports, emit a great deal more on an ongoing basis. Light can attract invertebrates, potentially affecting distributions in a highly localized area. Light could also disrupt natural cycles, e.g., spawning, possibly leading to short-term impacts. Light from structures is widespread and permanent near the coast, but minimal offshore.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast, but minimal offshore.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
New cable emplacement/ maintenance	Cable maintenance activities infrequently disturb benthic resources and cause temporary increases in suspended sediment; these disturbances would be local and limited to the emplacement corridor. New cables are infrequently added near shore. Cable emplacement/maintenance activities injure and kill benthic resources and result in temporary to long-term habitat alterations. The intensity of impacts depends on the time (season) and place (habitat type) where the activities occur. (See also the IPFs of seafloor profile alterations and sediment deposition and burial.)	Future new cables would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in local short-term impacts. The FCC has two pending submarine telecommunication cable applications in the North Atlantic. If the cable routes enter the geographic analysis area for this resource, short-term disturbance would be expected. The intensity of impacts would depend on the time (season) and place (habitat type) where the activities would occur.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Noise: Aircraft	Noise from aircraft reaches the sea surface on a regular basis. However, there is not likely to be any impact of aircraft noise on benthic habitat and invertebrates, as very little of the aircraft noise propagates through the water.	Aircraft noise is likely to continue to increase as commercial air traffic increases. However, there is not likely to be any impact of aircraft noise on benthic habitat and invertebrates.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Noise: Onshore/offshore construction	Noise from construction occurs frequently in the nearshores of populated areas in New England and the mid-Atlantic region but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. Detectable impacts of construction noise on benthic resources rarely, if ever, overlap from multiple sources. See also sub-IPF for Noise: Pile driving.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Detectable impacts of construction noise on benthic resources would rarely, if ever, overlap from multiple sources.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Noise: G&G	Ongoing site characterization surveys and scientific surveys produce noise around sites of investigation. These activities can disturb invertebrates in the immediate vicinity of the investigation and can cause temporary behavioral changes. The extent depends on equipment used, noise levels, and local acoustic conditions. Detectable impacts of G&G noise on benthic resources rarely, if ever, overlap from multiple sources.	Site characterization surveys, scientific surveys, and exploratory oil and gas surveys are anticipated to occur infrequently over the next 35 years. Seismic surveys used in oil and gas exploration create high-intensity impulsive noise to penetrate deep into the seafloor, potentially resulting in injury or mortality to invertebrates in a small area around each sound source and short-term stress and behavioral changes to individuals over a greater area. Site characterization surveys typically use sub-bottom profiler technologies that generate less intense sound waves more similar to common deep-water echosounders. The	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.

Associated IPFs: Sub-IFPs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
		intensity and extent of the resulting impacts are difficult to generalize, but are likely local and temporary. Detectable impacts of G&G noise on benthic resources would rarely, if ever, overlap from multiple sources.		
Noise: O&M	Some invertebrates could be able to hear the continuous underwater noise of operational WTGs. As measured at the BIWF, this low-frequency noise barely exceeds ambient levels at 164 feet (50 m) from the WTG base. Based on the results of Thomsen et al. (2015), sound pressure levels would be expected to be at or below ambient levels at relatively short distances (approximately 164 feet [50 m]) from WTG foundations. These low levels of elevated noise likely have little to no impact. Noise is also created by O&M of marine minerals extraction and commercial fisheries, each of which has small local impacts.	New or expanded marine minerals extraction and commercial fisheries could intermittently increase noise during their O&M over the next 35 years. Impacts would likely be small and local.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water and/or through the seafloor can cause injury and/or mortality to benthic resources in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area. Eggs, embryos, and larvae of invertebrates could also experience developmental abnormalities or mortality resulting from this noise, although thresholds of exposure are not known (Hawkins and Popper 2017; Weilgart 2018). The extent depends on pile size, hammer energy, and local acoustic conditions.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 to 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Noise: Cable laying/trenching	Infrequent trenching activities for pipeline and cable laying, as well as other cable burial methods, emit noise. These disturbances are local, temporary, and extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	New or expanded submarine cables and pipelines are likely to occur in the geographic analysis area. These disturbances would be infrequent over the next 35 years, local, temporary, and extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance, including dredging. Port utilization is expected to increase over the next 35 years.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future. In addition, the general trend along the coast from Virginia to Maine is that port activity would increase modestly. The ability of ports to receive the increase could require port modifications, leading to local impacts.	**Offshore:** The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Activities like dredging and the expansion or development of new overwater structures could lead to adverse effects on coastal and estuarine benthic habitats and invertebrates or benthic resources. However, any such impacts would be outside the geographic analysis area for benthic habitat and the nature and extent of these impacts on invertebrates cannot currently be quantified as no specific port improvement activities have	**Offshore:** Several regional ports could be used during Project construction and decommissioning, including ports in Baltimore, MD; New Bedford, MA; New London, CT; Norfolk, VA; Paulsboro, NJ; and Providence, RI, as well as Europe. The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Port improvements could include activities like dredging and the development of new overwater structures that could adversely affect benthic resources or invertebrates within the geographic analysis

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
		Future channel-deepening activities would likely be undertaken. Existing ports have already affected benthic resources and invertebrates, and future port projects would implement BMPs to minimize impacts. Although the degree of impacts would likely be undetectable outside the immediate vicinity of the ports, adverse impacts for certain species and/or life stages could lead to impacts on benthic resources and invertebrates beyond the vicinity of the port.	been proposed. Therefore, these activities would have a **negligible** adverse impact on benthic resources and invertebrates. Any future port expansion would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential environmental effects.	area, but no specific improvements are included in Alternatives B through F. Any future port expansion incentivized by the Project would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential environmental effects. Therefore, these localized and cumulative habitat impacts would have **a negligible** adverse effect on benthic habitats or marine invertebrates during Project construction, O&M, and decommissioning.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear are periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb, injure, or kill benthic resources, creating small short-term, localized impacts.	Future new cables would present additional risk of gear loss, resulting in small short-term, localized impacts (disturbance, injury).	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Presence of structures: Hydrodynamic disturbance	Human-made structures, especially tall vertical structures such as foundations for towers of various purposes, continuously alter local water flow at a fine scale. Water flow typically returns to background levels within a relatively short distance from the structure. Therefore, impacts on benthic resources and invertebrates are typically undetectable. Indirect impacts of structures influencing primary productivity and higher trophic levels are possible but are not well understood. New structures are periodically added.	Tall vertical structures can increase seafloor scour and sediment suspension. Impacts would likely be highly localized and difficult to detect. Indirect impacts of structures influencing primary productivity and higher trophic levels are possible but are not well understood.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, continuously create uncommon relief in a mostly sandy seascape. Structure-oriented fishes are attracted to these locations. Increased predation upon benthic resources by structure-oriented fishes can adversely affect populations and communities of benthic resources. These impacts are local and permanent.	New cables installed in the geographic analysis area over the next 35 years would likely require hard protection atop portions of the route (see the New cable emplacement/maintenance row in this table). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat, sandy seascape. Structure-oriented fishes could be attracted to these locations. Increased predation upon benthic resources by structure-oriented fishes could adversely affect populations and communities of benthic resources. These impacts are expected to be local and permanent as long as the structures remain.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Presence of structures: Habitat conversion	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables continuously provide uncommon hard-bottom habitat. A large portion is homogeneous sandy seascape but there is some other hard and/or complex habitat. Benthic species dependent on hard-bottom habitat and structure-oriented species thus benefit on a constant basis; however, the diversity could decline over time as early colonizers are replaced by successional communities dominated by blue mussels and anemones (Degraer et al. 2019: Chapter 7) and the new habitat can also be	Any new towers, buoy, piers, or cable protection structures would create uncommon relief in a mostly sandy seascape. Benthic species dependent on hard-bottom habitat could benefit, although the new habitat could also be colonized by invasive species (e.g., certain tunicate species), and the diversity could decline over time as early colonizers are replaced by successional communities dominated by blue mussels and anemones (Degraer et al. 2019: Chapter 7). Soft bottom is the dominant habitat type in the region, and species that rely	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	colonized by invasive species (e.g., certain tunicate species). Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitat to the new hard-structure habitat.	on this habitat would not likely experience population-level impacts (Greene et al. 2010; Guida et al. 2017).		
Presence of structures: Migration disturbances	Human structures in the marine environment (e.g., shipwrecks, artificial reefs, and oil platforms) can attract invertebrates that approach the structures during their migrations. To date, BOEM has not identified any published evidence to suggest that human structures pose a barrier to, or slow, migratory invertebrates.	The infrequent installation of future new structures in the marine environment over the next 35 years could attract invertebrates that approach the structures during their migrations. This could slow migrations. Migratory animals would likely be able to proceed from structures unimpeded.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Presence of structures: Transmission cable infrastructure	The presence of transmission cable infrastructure, especially hard protection atop cables, causes impacts through entanglement/gear loss/damage, fish aggregation, and habitat conversion.	See other sub-IPFs within Presence of structures rows.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Discharges	The gradually increasing amount of vessel traffic is increasing the cumulative permitted discharges from vessels. Many discharges are required to comply with permitting standards established to ensure potential impacts on the environment are minimized or mitigated. However, there does not appear to be evidence that the volumes and extents have any impact on benthic resources.	There is the potential for new ocean dumping/dredge disposal sites in the Northeast. Impacts (disturbance, reduction in fitness) of infrequent ocean disposal to benthic resources are short term because spoils are typically recolonized naturally. In addition, the EPA has established dredge spoil criteria and it regulates the disposal permits issued by the USACE; these discharges are required to comply with permitting standards established to ensure potential impacts on the environment are minimized or mitigated.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Sediment deposition and burial	Ongoing sediment dredging for navigation purposes results in fine sediment deposition. Ongoing cable maintenance activities also infrequently disturb bottom sediments; these disturbances are local and limited to the emplacement corridor. Sediment deposition could have adverse impacts on some benthic resources, especially eggs and larvae, including smothering and loss of fitness—particularly demersal eggs such as longfin squid, which are known to have high rates of egg mortality if egg masses are exposed to abrasion or burial. Impacts could vary based on season/time of year. Where dredged materials are disposed, benthic resources are smothered. However, such areas are typically recolonized naturally in the short term. Most sediment dredging projects have time-of-year restrictions to minimize impacts on benthic resources. Most benthic resources in the geographic analysis area are adapted to the turbidity and periodic sediment deposition that occur naturally in the geographic analysis area.	The USACE and/or private ports could undertake dredging projects periodically. Where dredged materials are disposed, benthic resources are buried. However, such areas are typically recolonized naturally in the short term. Most benthic resources in the geographic analysis area are adapted to the turbidity and periodic sediment deposition that occur naturally in the geographic analysis area.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Vessel traffic	While ongoing vessel activity could have some effect on behavior, it is likely limited to brief startle and temporary stress responses. Ongoing activities that contribute to this	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly	**Offshore:** Construction and operational vessel traffic from future wind farm development and decommissioning would not be expected to measurably affect marine	**Offshore:** Construction, O&M, and decommissioning of vessel cooling systems could entrain planktonic eggs and larvae of fish and invertebrates, leading to injury or

Associated IPFs: Sub-IFPs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	increase over the next 30 years. Even with increased port visits by deep draft vessels, this is still a relatively small adjustment when considering the whole of New England vessel traffic.	invertebrates and benthic habitat structure and composition. Although construction and O&M of vessel cooling systems could entrain planktonic eggs and larvae of fish and invertebrates, leading to injury or mortality of some individuals, these effects are not expected to be measurable relative to natural mortality rates, which can range from 1 to 10% per day or higher (White et al. 2014). Therefore, these effects are unlikely to be significant at the population level. Vessel traffic would have no measurable effects on benthic habitat and benthic or pelagic invertebrates aside from underwater noise exposure and vessel anchoring, which are addressed separately above. Therefore, vessel traffic effects on benthic habitat and invertebrates from the construction, O&M, and decommissioning of planned and potential future offshore wind energy projects would be **negligible** adverse relative to baseline conditions in the affected environment.	mortality of individuals. However, these short-term effects are not expected to be measurable relative to natural mortality rates and are therefore unlikely to be significant at the population level. Therefore, vessel traffic effects on invertebrates and benthic habitat would be **negligible** adverse for all Project alternatives and configurations. Although Alternatives C through F would decrease the total number of vessel trips and duration of vessel activity required for O&M and decommissioning relative to the Proposed Action, impacts would remain **negligible** adverse for all Project alternatives. The construction and O&M of all Project alternatives and other planned and potential future offshore wind energy projects would require the use of construction and operational vessels. This would increase the number of vessels operating in the invertebrate geographic analysis area for the foreseeable future. However, vessel-related entrainment mortality is unlikely to be significant at the population level for any invertebrate species. Therefore, vessel traffic cumulative effects on benthic habitat and invertebrates in combination with other planned and potential future offshore wind energy projects would be **negligible** adverse relative to baseline conditions in the affected environment.
Climate change: Ocean acidification	Ongoing CO_2 emissions causing ocean acidification could contribute to reduced growth or the decline of benthic invertebrates that have calcareous shells, as well as reefs and other habitats formed by shells, over the course of the next 35 years.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Climate change: Warming and sea level rise, altered habitat, ecology, and migration patterns	Climate change, influenced in part by ongoing GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters, influencing the distributions of benthic species and altering ecological relationships, likely causing permanent changes of unknown intensity gradually over the next 35 years.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.
Climate change: Warming and sea level rise, disease frequency	Climate change, influenced in part by ongoing GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters, influencing the frequencies of various diseases of benthic species and likely causing permanent changes of unknown intensity over the next 35 years.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Sections 3.6.1.1.1 and 3.6.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.	See Sections 3.6.2.2 through 3.6.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat or invertebrates and are not analyzed.

Finfish and Essential Fish Habitat

Table E2-4. **Summary of Activities and the Associated Impact-Producing Factors for Finfish and Essential Fish Habitat**

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Impacts, including mortality, decreased fitness, and contamination of habitat, are localized and temporary and rarely affect populations.	See Table E1-4 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Impacts are unlikely to affect populations.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Accidental releases: Invasive species	Invasive species are periodically released accidentally during ongoing activities, including the discharge of ballast water and bilge water from marine vessels. The impacts on finfish and EFH depend on many factors, but can be widespread and permanent.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Anchoring	Vessel anchoring related to ongoing military use and survey, commercial, and recreational activities continues to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor. Impacts on finfish and EFH are greatest for sensitive EFH (e.g., eelgrass, hard bottom) and slow-moving species.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. These impacts would include increased turbidity levels and potential for direct contact, causing mortality of benthic species and, possibly, degradation of sensitive habitats. All impacts would be localized; turbidity would be temporary; impacts from direct contact would be recovered in the short term. Degradation of sensitive habitats such as certain types of hard bottom (e.g., boulder piles), if it occurs, could be long term.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
EMFs	EMFs emanate continuously from installed telecommunication and electrical power transmission cables. Biologically significant impacts on finfish and EFH have not been documented for AC cables (CSA Ocean Sciences, Inc. and Exponent 2019; Thomsen et al. 2015), but behavioral impacts have been documented for benthic species (skates and lobster) near operating DC cables (Hutchison et al. 2018). The impacts are localized and affect the animals only while they are within the EMF. There is no evidence to indicate that EMF from undersea AC power cables negatively affects commercially and recreationally important fish species within the southern New England area (CSA Ocean Sciences, Inc. and Exponent 2019).	During operation, future new cables would produce EMF. (See table cell to the left.) Submarine power cables in the geographic analysis area for this resource are assumed to be installed with appropriate shielding and burial depth to reduce potential EMF to low levels. EMF of any two sources would not overlap (even for multiple cables within a single export cable corridor). Although the EMF would exist as long as a cable was in operation, impacts, on finfish and EFH would likely be difficult to detect.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Light: Vessels	Marine vessels have an array of lights, including navigational lights and deck lights. There is little downward-focused lighting and therefore only a small fraction of the emitted light enters the water. Light can attract finfish, potentially affecting distributions in a highly	See table cell to the left.	Artificial light can attract finfish and can influence or disrupt biological functions (e.g., timing of cod spawning) (Rich and Longcore 2006) that are triggered by changes in daily and seasonal daylight cycles. Planned future activities include up to 3,008 offshore WTGs and OSS foundations. The construction and O&M of these structures would introduce new short-term and long-term	**Offshore:** Artificial lighting during construction, O&M, and decommissioning at the RWF would be associated with navigational and deck lighting on vessels from dusk to dawn. Lighting would be hooded and directed downward to avoid unnecessary illumination of the surrounding environment to the extent practicable. Reaction of finfish, including EFH species, to this artificial light is highly

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	localized area. Light could also disrupt natural cycles (e.g., spawning), possibly leading to short-term impacts.		sources of artificial light to the offshore environment in the form of vessel lighting and navigation and safety lighting on the structures, respectively. Orr et al. (2013) developed design and mitigation recommendations for reduction of biologically significant impacts from artificial light in offshore wind infrastructure. Based on these findings, BOEM (2021) has issued design guidance for avoiding and minimizing artificial lighting impacts from such activities and has concluded that adherence to these measures should effectively avoid adverse effects on fish. BOEM would require all future offshore energy projects to comply with this guidance. Given the minimal and localized nature of anticipated lighting impacts under this guidance, the related effects from proposed future activities on finfish and EFH in the geographic analysis area are likely to be **negligible** adverse.	species dependent and could include attraction and/or avoidance of the area. Artificial lighting could disrupt the migration patterns of fish, increase risk of predation and disrupt predator prey interactions, and alter species' richness and community composition in the affected area (Nightingale et al. 2006; Orr et al. 2013). However, these types of effects are most associated with bright permanent lights on nearshore and overwater structures. The Project would comply with BOEM (2021) issued design guidance for avoiding and minimizing artificial lighting impacts. Therefore, lighting effects on finfish and EFH would be short term to long-term **negligible** adverse for Alternatives B through F, with reduced impacts under Alternatives C through F due to a decrease in total duration of construction vessel activity. BOEM estimates a cumulative total of up to 3,110 offshore WTGs and OSS foundations for the Project plus all other future offshore wind projects in the finfish and EFH geographic analysis area. For reasons described in the preceding paragraph, the cumulative impacts associated with all Project alternatives when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse, mostly attributable to existing, ongoing activities.
Light: Structures	Offshore buoys and towers emit light, and onshore structures, including buildings and ports, emit a great deal more on an ongoing basis. Light can attract finfish, potentially affecting distributions in a highly localized area. Light could also disrupt natural cycles (e.g., spawning), possibly leading to short-term impacts. Light from structures is widespread and permanent near the coast but minimal offshore.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Light: Vessels for analysis.	See Light: Vessels for analysis of impacts.
New cable emplacement/ maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances are local and limited to the cable corridor. New cables are infrequently added near shore. Cable emplacement/maintenance activities disturb, displace, and injure finfish and result in temporary to long-term habitat alterations. The intensity of impacts depends on the time (season) and place (habitat type) where the activities occur. (See also the IPF of Sediment deposition and burial.)	Future new cables would occasionally disturb the seafloor and cause temporary increases in suspended sediment, resulting in local short-term impacts. The FCC has two pending submarine telecommunications cable applications in the North Atlantic. If the cable routes enter the geographic analysis area for this resource, short-term disturbance would be expected. The intensity of impacts would depend on the time (season) and place (habitat type) where the activities would occur.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Noise: Aircraft	Noise from aircraft reaches the sea surface on a regular basis. However, aircraft noise is not likely to impact finfish and EFH, as very little of the aircraft noise propagates through the water.	Aircraft noise is likely to continue to increase as commercial air traffic increases. However, aircraft noise is not likely to impact aircraft noise on finfish and EFH.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Noise: Onshore/Offshore construction	Noise from construction occurs frequently in nearshores of populated areas in New England and the mid-Atlantic region but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. See also sub-IPF for Noise: Pile driving.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Noise: G&G and scientific surveys	Ongoing site characterization surveys and scientific surveys produce noise around sites of investigation. These activities can disturb finfish in the immediate vicinity of the investigation and can cause temporary behavioral changes. The extent depends on equipment used, noise levels, and local acoustic conditions.	Site characterization surveys, scientific surveys, and exploratory oil and gas surveys are anticipated to occur infrequently over the next 35 years. Seismic surveys used in oil and gas exploration create high-intensity impulsive noise to penetrate deep into the seafloor, potentially resulting in injury or mortality to finfish in a small area around each sound source and short-term stress and behavioral changes to individuals over a greater area. Site characterization surveys typically use sub-bottom profiler technologies that generate less-intense sound waves more similar to common deep-water echosounders. The intensity and extent of the resulting impacts are difficult to generalize, but are likely local and temporary.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Noise: O&M	Some finfish and invertebrates could be able to hear the continuous underwater noise of operational WTGs. As measured at the BIWF, this low frequency noise barley exceeds ambient levels at 164 feet (50 m) from the WTG base. Based on the results of Thomsen et al. (2015), sound pressure levels would be expected to be at or below ambient levels at relatively short distances (approximately 164 feet [50 m]) from WTG foundations. These low levels of elevated noise likely have little to no impact. Noise is also created by O&M of marine minerals extraction and commercial fisheries, each of which has small local impacts.	New or expanded marine minerals extraction and commercial fisheries could intermittently increase noise during their O&M over the next 35 years. Impacts would likely be small and local.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water and/or the seafloor can cause injury and/or mortality to finfish in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area. Eggs, embryos, and larvae of finfish and invertebrates could also experience developmental abnormalities or mortality resulting from this noise, although thresholds of exposure are not known (Hawkins and Popper 2017; Weilgart 2018). Potentially injurious noise could also be considered as rendering EFH temporarily unavailable or unsuitable for the duration of the noise. The extent depends on pile size, hammer energy, and local acoustic conditions.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Noise: Cable laying/ trenching	Infrequent trenching activities for pipeline and cable laying, as well as other cable burial methods, emit noise. These disturbances are temporary, local, and extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	New or expanded submarine cables and pipelines are likely to occur in the geographic analysis area for this resource. These disturbances would be infrequent over the next 35 years, temporary, local, and extend only a short distance beyond the emplacement corridor. Impacts of this noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Noise: Vessels	While ongoing vessel noise could have some effect on behavior and masking, it is likely limited to brief startle and temporary stress responses. Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	See table cell to the left.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance, including dredging. Port utilization is expected to increase over the next 35 years.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future. In addition, the general trend along the coast from Virginia to Maine is that port activity would increase modestly. The ability of ports to receive the increase could require port modifications, leading to local impacts. Future channel-deepening activities would likely be undertaken. Existing ports have already affected finfish and EFH, and future port projects would implement BMPs to minimize impacts. Although the degree of impacts on EFH would likely be undetectable outside the immediate vicinity of the ports, adverse impacts on EFH for certain species and/or life stages could lead to impacts on finfish and EFH beyond the vicinity of the port.	The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Activities like dredging and the expansion or development of new overwater structures could lead to adverse effects on finfish, including EFH species, and coastal and estuarine habitats. Resulting effects on finfish would vary depending on the types of species and habitats present. However, the nature and extent of these impacts cannot currently be quantified as no specific port improvement activities have been proposed. All future port improvements would be subject to independent environmental permitting and regulatory review. Any resulting effects on finfish would be evaluated as part of those efforts. Therefore, impacts to finfish and EFH would be **negligible** adverse.	**Offshore:** Several regional ports could be used during Project construction, including ports in Baltimore, MD; New Bedford, MA; New London, CT; Norfolk, VA; Paulsboro, NJ; and Providence, RI, as well as Europe. The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Port improvements could include activities like dredging and the development of new overwater structures that could adversely affect finfish and EFH within the geographic analysis area, but no specific improvements are included in Alternatives B through F. Any future port expansion would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential environmental effects. Therefore, Project-specific and cumulative port utilization impacts would be **negligible** adverse.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb habitats and potentially harm individuals, creating small localized, short- to long-term impacts.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Presence of structures: Hydrodynamic disturbance	Human-made structures, especially tall vertical structures such as foundations for towers of various purposes, continuously alter local water flow at a fine scale. Water flow typically returns to background levels within a relatively short distance from the structure. Therefore, impacts on finfish and EFH are typically undetectable. Indirect impacts of structures influencing primary	Tall vertical structures can increase seafloor scour and sediment suspension. Impacts would likely be highly localized and difficult to detect. Indirect impacts of structures influencing primary productivity and higher trophic levels are possible but are not well understood.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	productivity and higher trophic levels are possible but are not well understood. New structures are periodically added.			
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. Structure-oriented fishes are attracted to these locations. These impacts are local and often permanent. Fish aggregation could be considered adverse, beneficial, or neutral.	New cables, installed incrementally in the geographic analysis area for this resource over the next 20 to 35 years, would likely require hard protection atop portions of the route (see the New cable emplacement/maintenance IPF). Any new towers, buoys, or piers would also create uncommon relief in a mostly sandy seascape. Structure-oriented fishes could be attracted to these locations. Abundance of certain fishes could increase. These impacts are local and could be permanent.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Presence of structures: Habitat conversion	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. A large portion is homogeneous sandy seascape, but there is some hard-bottom and/or complex habitat; structure-oriented species thus benefit on a constant basis. Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitat to the new hard-structure habitat.	New cable, installed incrementally in the geographic analysis area over the next 20 to 35 years, would likely require hard protection atop portions of the route (see New cable emplacement/maintenance row). Any new towers, buoys, or piers would also create uncommon relief in a mostly sandy seascape. Structure-oriented species would benefit (Claisse et al. 2014; Smith et al. 2016). Soft bottom is the dominant habitat type from Cape Hatteras to the Gulf of Maine (over 60 million acres), and species that rely on this habitat would not likely experience population-level impacts (Guida et al. 2017; Greene et al. 2010).	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Presence of structures: Migration disturbances	Human-made structures in the marine environment (e.g., shipwrecks, artificial reefs, and oil platforms), can attract finfish that approach the structures during their migrations. This could slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement (Fabrizio et al. 2014; Moser and Shepherd 2009; Secor et al. 2018). There is no evidence to suggest that structures pose a barrier to migratory animals.	The infrequent installation of future new structures in the marine environment over the next 35 years could attract finfish that approach the structures during their migrations. This could tend to slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement (Fabrizio et al. 2014; Moser and Shepherd 2009; Secor et al. 2018). Migratory animals would likely be able to proceed from structures unimpeded.	See Section 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Presence of structures: Transmission cable infrastructure	See other sub-IPFs within the Presence of structures IPF. See Table E2-1 on Coastal Habitats and Fauna.	See other sub-IPFs within the Presence of structures IPF	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Sediment deposition and burial	Ongoing sediment dredging for navigation purposes results in fine sediment deposition. Ongoing cable maintenance activities also infrequently disturb bottom sediments; these disturbances are local and limited to the emplacement corridor. Sediment deposition could have negative impacts on eggs and larvae, including smothering and loss of fitness. Impacts could vary based on season/time of year.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
Vessel traffic	Ongoing activities that contribute to this IPF include commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. However, no substantial changes are anticipated to existing vessel traffic volumes.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels, this is still a relatively small adjustment when considering the whole of New England vessel traffic. Vessel traffic is expected to continue at or near current levels.	Construction and O&M vessel cooling systems could entrain planktonic fish eggs and larvae, leading to injury or mortality of some finfish, including EFH individuals. However, these effects are not expected to be measurable relative to natural mortality rates, which can range from 1 to 10% per day or higher (White et al. 2014) and are therefore unlikely to be significant at the population level. Therefore, vessel traffic effects on finfish and EFH from the construction, O&M, and decommissioning of planned and potential future offshore wind energy projects would be **negligible** adverse relative to baseline conditions in the affected environment.	Vessels used for Project construction, O&M, and decommissioning could entrain planktonic finfish eggs and larvae in their cooling systems, leading to injury or mortality of individuals. However, these effects are not expected to be measurable relative to natural mortality rates and are therefore unlikely to be significant at the population level. Therefore, vessel traffic effects on finfish and EFH from Project construction, O&M, and decommissioning would be **negligible** adverse. The construction and O&M of Alternatives B through F and other planned and potential future offshore wind energy projects would require the use of construction and operational vessels. This would increase the number of vessels operating in the finfish and EFH geographic analysis area for the foreseeable future. While the number of vessels operating in the geographic analysis area is large, the number of individual eggs and larvae exposed to entrainment-related mortality effects from individual vessels is negligible relative to natural mortality rates. Therefore, vessel traffic cumulative effects on finfish and EFH from the construction, O&M, and decommissioning of Alternatives B through F in combination with other planned and potential future offshore wind energy projects would be **negligible** adverse relative to baseline conditions in the affected environment.
Climate change: Ocean acidification	Continuous carbon dioxide emissions causing ocean acidification could contribute to reduced growth or the decline of finfish and EFH over the course of the next 35 years.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Climate change: Warming and sea level rise, altered habitat/ ecology	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters over the next 35 years, influencing the distributions of finfish and EFH. This sub-IPF has been shown to affect the distribution of fish in the northeast United States, with several species shifting their centers of biomass either northward or to deeper waters (Hare et al. 2016).	See above.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Climate change: Warming and sea level rise, altered migration patterns	See above.	See above.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.
Climate change: Warming and sea level rise, disease frequency	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming	See above.	See Sections 3.13.1.1.1 and 3.13.1.2.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs	See Sections 3.13.2.2 through 3.13.2.5 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	of ocean waters over the next 35 years, influencing the frequencies of various diseases of finfish.		associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.	associated with onshore activities would have no measurable effect on finfish or EFH and are not analyzed.

Marine Mammals

Table E2-5. Summary of Activities and the Associated Impact-Producing Factors for Marine Mammals

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a quantitative analysis of these risks. Ongoing releases are frequent/chronic. Marine mammal exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality or sublethal effects on individual fitness, including adrenal effects, hematological effects, liver effects lung disease, poor body condition, skin lesions, and several other health affects attributed to oil exposure (Kellar et al. 2017; Mazet et al. 2001; Mohr et al. 2008; Smith et al. 2017; Sullivan et al. 2019; Takeshida et al. 2017). Additionally, accidental releases could result in impacts on marine mammals due to effects to prey species (see Table E2-4).	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases described for ongoing activities.	**Offshore:** BOEM prohibits the discharge or disposal of solid debris into offshore waters during any activity associated with the construction and operation of offshore energy facilities (30 CFR 250.300). The USCG similarly prohibits the dumping of trash or debris capable of posing entanglement or ingestion risk (MARPOL, Annex V, Public Law 100–220 (101 Stat. 1458)). Baulch and Perry (2014) identified ingested debris as the likely cause of mortality in 22% of beached marine mammal carcasses. Approximately 50% of marine mammal species worldwide have been documented ingesting marine litter (Werner et al. 2016). While development of future offshore wind facilities and associated marine vessels could be a source of accidental releases of trash and debris, BOEM and USCG requirements would effectively avoid and minimize impacts such that the resulting effects to marine mammals would be **negligible** adverse. BOEM also requires applicants to develop spill response and containment plans to quickly address accidental spills of fuels, lubricants, and other contaminants. A total of approximately 23 million gallons of coolants, fuels, oils, and lubricants could be stored within WTG foundations and OSSs across all projected offshore wind projects along the Atlantic coast. A large spill of toxic materials (fuels, lubricants, and other contaminants) could potentially injure or kill several individual marine mammals and adversely affect habitat suitability and would require extensive mitigation to offset. All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and the BSEE. Oil spill response plans are required for each project and would provide for rapid spill response, cleanup, and other measures that would help to minimize potential impact on affected resources. Given the low probability of a large spill event, impacts to marine mammals from this IPF are likely to be **negligible** adverse.	**Offshore:** Construction vessels and offshore structures pose a theoretical source of marine debris and entanglement risk and accidental discharges of petroleum products and other toxic substances. Marine debris is a known source of adverse effects to marine mammals (Laist 1997; NOAA-MDP 2014a, 2014b). Revolution Wind would follow strict oil spill prevention and response procedures during all Project phases; would comply with all debris and pollution requirements; and has developed a detailed spill response and containment plan as a Project EPM. These regulatory requirements and the EPM would effectively avoid releases of abandoned marine debris and would avoid and minimize impacts from accidental spills such that adverse effects on marine mammals are unlikely to occur. In the unlikely event that an accidental spill should occur, individual marine mammals could be injured or killed; habitat suitability could be adversely affected; and extensive mitigation would be required. However, due to the low likelihood of such an event, the temporary nature of the impacts, and established EPMs, effects on marine mammals from this impact mechanism would be **negligible** adverse for Alternatives B through F. Existing and planned future offshore wind-energy development could result in the accidental release of water quality contaminants or trash/debris, which could theoretically lead to an increase in debris and pollution in the marine mammal geographic analysis area (see Section 3.15.1.1 for characterization of existing marine pollution conditions). Compliance with debris and pollution requirements would effectively minimize releases of trash and debris. Given these restrictions, the risk to marine mammals from trash and debris from Alternatives B through F in combination with those from other planned and potential future activities is **negligible** adverse. Moreover, Alternatives B through F would similarly include inspection offshore structures and removal of derelict fishing gear and other accumulated debris. This

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				would provide a **minor** benefit by removing potentially harmful marine debris from the environment.
Accidental releases: Trash and debris	Trash and debris could be accidentally discharged through fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey activities; and cable, line, and pipeline laying, and debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low quantity, local, and low-impact events. Worldwide, 62 of 123 (50.4%) marine mammal species have been documented ingesting marine litter (Werner et al. 2016). Stranding data indicate potential debris induced mortality rates of 0 to 22%. Mortality has been documented in cases of debris interactions as well as blockage of the digestive tract, disease, injury, and malnutrition (Baulch and Perry 2014). However, it is difficult to link physiological effects to individuals to population-level impacts (Browne et al. 2015).	As population and vessel traffic increase gradually over the next 35 years, accidental release of trash and debris could increase. Trash and debris could continue to be accidentally released through fisheries use and other offshore and onshore activities. There could also be a long-term risk from exposure to plastics and other debris in the ocean. Worldwide, 62 of 123 (50.4%) of marine mammal species have been documented ingesting marine litter (Werner et al. 2016). Mortality has been documented in cases of debris interactions, as well as blockage of the digestive tract, disease, injury, and malnutrition (Baulch and Perry 2014).	See Accidental releases: Fuel/fluids/hazmat for analysis.	See Accidental releases: Fuel/fluids/hazmat for analysis.
EMFs	EMFs emanate constantly from installed telecommunication and electrical power transmission cables. Marine mammals appear to have a detection threshold for magnetic intensity gradients (i.e., changes in magnetic field levels with distance) of 0.1% of the Earth's magnetic field or about 0.05 μT (Kirschvink 1990) and are thus likely to be very sensitive to minor changes in magnetic fields (Walker et al. 2003). There is a potential for animals to react to local variations of the geomagnetic field caused by power cable EMFs. Depending on the magnitude and persistence of the confounding magnetic field, such an effect could cause a trivial temporary change in swim direction or a longer detour during the animal's migration (Gill et al. 2005). Such an effect on marine mammals is more likely to occur with DC cables than with AC cables (Normandeau Associates, Inc. et al. 2011). However, there are numerous transmission cables installed across the seafloor, and no impacts on marine mammals have been demonstrated from this source of EMF.	During operation, future new cables would produce EMF. Submarine power cables in the marine mammal geographic analysis area are assumed to be installed with appropriate shielding and at a sufficient burial depth to reduce potential EMF to low levels. EMF of any two sources would not overlap. Although the EMF would exist as long as a cable was in operation, impacts, if any, would likely be difficult to detect, if they occur at all. Marine mammals have the potential to react to submarine cable EMF; however, no effects from the numerous submarine cables have been observed. Further, this IPF would be limited to extremely small portions of the areas used by migrating marine mammals. As such, exposure to this IPF would be low, and as a result, impacts on marine mammals would not be expected.	**Offshore:** Under the No Action Alternative, up to 10,024 miles of cable would be added in the geographic analysis area, producing EMF in the immediate vicinity of each cable during operations. BOEM anticipates that the proposed offshore energy projects would use HVAC transmission, but HVDC designs are possible and could occur. EMF effects on marine mammals from these future projects would vary in extent and magnitude depending on overall cable length, the proportion of buried vs. exposed cable segments, and project-specific transmission design (e.g., HVAC or HVDC, transmission voltage, etc.). However, measurable EMF effects are generally limited to within inches to tens of feet of cable corridors, and standard design guidance for offshore wind energy transmission cable installation (i.e., avoiding cable crossings and maintaining a minimum separation) would limit additive EMF effects from adjacent cables. BOEM would additionally require these future submarine power cables to have appropriate shielding and be at a sufficient	**Offshore:** Exponent (2021) modeled EMF levels that could be generated by the RWEC, OSS-link cable, and IACs. They estimated induced magnetic field levels ranging from 147 to 1,071 mG on the bed surface above the buried and exposed RWEC and OSS-link cable and 57 to 522 mG above the IACs (see the EMF summary table in Section 3.6.2.3.2). Induced field strength would decrease rapidly with distance from the source, dropping below 100 mG within 3.3 feet of the seafloor directly above the cables. Induced magnetic field strength would fall effectively to 0 mG within 25 feet of the centerline of each cable segment. The only exception would occur at the RWEC landing location, where the two cable corridors would approach to within 10 feet. Measurable magnetic field effects would extend between 25 to 50 feet from the outer edge of the combined cable path. The magnetic field effects generated by exposed segments of the IAC, RWEC, and OSS-link cable are comparable in magnitude to the Earth's natural magnetic field, which is on the order of 517 mG within the RWF. Background magnetic field conditions would fluctuate by 1 to 10 mG

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			burial depth to minimize potential EMF effects from cable operations. At least seven existing submarine power and communications cables are present in the vicinity of the RI/MA WEA. These cables would presumably continue to operate and generate EMF effects under the No Action Alternative. While the type and capacity of those cables is not specified, the associated baseline EMF effects can be inferred from available literature. Electrical telecommunications cables are likely to induce a weak EMF on the order of 1 to 6.3 µV/m within 3.3 feet (1 m) of the cable path (Gill et al. 2005). Fiber-optic communications cables with optical repeaters would not produce EMF effects. Additionally, literature suggests that most marine species cannot sense low-intensity electric or magnetic fields generated by the HVAC power transmission cables commonly used in offshore wind energy projects (Gill et al. 2005; Kilfoyle et al. 2018). EMF effects from continued operations of existing submarine power cables would produce similar **negligible** adverse effects on marine mammals for the duration of cable operations because of the localized nature of the effects and limited anticipated exposure.	from the natural field effects produced by waves and currents. The maximum induced electrical field experienced by any organism close to the exposed cable would be no greater than 0.7 mV/m (Exponent 2021). BOEM has conducted literature reviews and analyses of potential EMF effects from offshore renewable energy projects (CSA Ocean Sciences Inc. and Exponent 2019; Inspire Environmental 2019; Normandeau et al. 2011). These and other available reviews and studies (Gill et al. 2005; Kilfoyle et al. 2018) suggest that most marine species cannot sense low-intensity electric or magnetic fields generated by the HVAC power transmission cables commonly used in offshore wind energy projects. Normandeau et al. (2011) concluded that marine mammals are unlikely to detect magnetic field intensities below 50 mG, suggesting that these species would be insensitive to EMF effects from Project electrical cables. Project-related EMFs would drop below this threshold and would become undetectable within 3.3 feet (1 m) of the seafloor, except for RWEC cable segments lying on the bed surface. The area exposed to magnetic field effects greater than 50 mG would be small, extending less than 5 feet above the bed surface immediately over the exposed cable segment. The 50-mG detection threshold is theoretical and an order of magnitude lower than the lowest observed magnetic field strength resulting in observed behavioral responses (Normandeau et al. 2011). These factors indicate that the likelihood of marine mammals encountering detectable EMF effects is low, and any exposure would be below levels associated with measurable biological effects. Therefore, EMF effects on marine mammals would be **negligible** adverse under Alternatives B through F. Due to the reduced total length of IAC under Alternatives C through F as compared to the Proposed Action, the EMF effects under Alternatives C through F would be similar in nature but proportionally less than under the Proposed Action. Due to the higher capacity of the turbines in Alternative F, there is potential for greater operational noise impacts around each individual turbine, although specifics of these impacts are not certain. BOEM anticipates that most planned facilities would use HVAC transmission, but some could use HVDC. BOEM would require all future projects to use cable designs and EPMs to minimize EMF impacts on the environment. While the range of EMF impacts would vary by project, they are expected to be similar in magnitude to those described for the Proposed Action. Standard design practices for offshore energy cables would avoid cable

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				crossings and maintain a minimum separation of several hundred feet between parallel cable paths where practicable (CSRIC 2014; Sharples 2011; TÜV SÜD PMSS 2014). This would minimize additive EMF effects from multiple cables. On this basis, cumulative EMF effects on marine mammals resulting from Alternatives B through F combined with existing, planned, and reasonably foreseeable activities would be **negligible** adverse due to the localized nature of effects and limited anticipated exposure.
Bycatch	Bycatch is a significant population stressor for smaller cetaceans and pinnepeds. NOAA examined the bycatch of 10 species of cetaceans and pinnepeds from the Mid-Atlantic bottom trawl fishery. Mean annual serious injury and mortality estimates for eight of the 10 species were below their potential biological removal (PBR) levels. The exceptions were gray and harp seals, for which PBRs are unknown. Bycatch occurs in various gillnet and trawl fisheries in New England and the mid-Atlantic coast, with hotspots driven by marine mammal density and fishing intensity (Lewison et al. 2014; NMFS 2018a).	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	A range of monitoring activities have been proposed to evaluate the short-term and long-term effects of existing and planned offshore wind development on biological resources and are also likely for future wind energy projects on the OCS. Some of these monitoring activities are likely to affect marine mammals through the potential for bycatch and/or injury by sample collection gear. Biological monitoring uses the same types of methods and equipment employed in commercial fisheries, meaning that impacts would be similar in nature but reduced in extent in comparison impacts from current and likely future fishing activity. Monitoring activities are commonly conducted by commercial fishers under contract who would otherwise be engaged in fishing activity. As such, research and monitoring activities related to offshore wind would not necessarily result in an increase in bycatch-related impacts on marine mammals, although the distribution of those impacts could change. Therefore, any bycatch-related impacts on invertebrates would be **negligible** to **minor** adverse and short term in duration.	Revolution Wind is proposing to implement the FRMP as part of Alternatives B through F (Revolution Wind and Inspire Environmental 2021). The FRMP employs a variety of survey methods to evaluate the effect of RWF construction and operation on benthic habitat structure and composition and on marine species. The following survey methods could impact marine mammals: Ventless trap surveys to evaluate changes in the distribution and abundance of lobster and Jonah crab in the RWF and adjacent reference areas and Jonah crab, lobster, whelk (Buccinidae), and finfish along the RWEC corridor and adjacent reference areas; these areas would be surveyed 12 times per month for 7 months each for 2 years prior to and at least 2 years following completion of Project construction (4 years total) Otter trawl surveys to assess abundance and distribution of target fish and invertebrate species within the RWF could impact a variety of invertebrate species as bycatch, four times per year for 2 years prior to and at least 2 years following completion of Project construction These surveys involve similar methods to and would complement other survey efforts conducted by various state, federal, and university entities supporting regional fisheries research and management. Survey fisheries gear (otter trawl surveys, ventless traps, and the anchoring lines and buoys used to secure acoustic telemetry equipment) could pose an entanglement risk to marine mammals. Post-ROD ventless trap surveys would employ the use of both weak link and weak rope technologies that are consistent with recommendations from NMFS. As such, impacts to marine mammals are

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				expected to be negligible based upon the limited number of associated buoy lines and the implementation of risk reduction measures such as no wet storage of fishery monitoring gear; no buoy lines floating at the surface; all sampling gear would be hauled at least once every 30 days; all gear would be removed from the water at the end of each sampling season; all groundlines would be constructed of sinking line; and knot-free buoy lines would be encouraged. For trawl surveys, large whale species have the speed and maneuverability to avoid oncoming mobile gear (NMFS 2016), and due to the few proposed trawl surveys and short tow times, impacts on marine mammals are anticipated to be **negligible** adverse. Acoustic telemetry receiver systems pose a negligible risk of harm to marine mammals. Based on the type of equipment and the fact that a small number of receivers deployed (up to 19 total) would be distributed over a large area, BOEM considers the effects of this Project element on marine mammals to be negligible. Similarly, moored and autonomous PAM systems would use the best available technology to reduce any potential risks of entanglement. PAM system deployment would avoid and minimize impacts. Therefore, the effects of this type of survey equipment on marine mammals would be **negligible** adverse.
Light	Light sources include marine vessels; offshore buoys and towers; and onshore structures, such as buildings and ports. Onshore structures emit a great deal of light on an ongoing basis, greater than offshore structures. Marine vessels have an array of lights, including navigational lights and deck lights. There is little downward-focused lighting and therefore only a small fraction of the emitted light enters the water. Light can attract finfish and invertebrates, potentially affecting distributions in a highly localized area. Light could also disrupt natural cycles (e.g., spawning), possibly leading to short-term impacts.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	**Offshore:** The addition of up to 3,008 new offshore structures in the geographic analysis area with long-term hazard and aviation lighting, as well as lighting associated with construction vessels, would increase artificial lighting. Orr et al. (2013) concluded that the operational lighting effects from wind farm facilities to marine mammal distribution, behavior, and habitat use were uncertain but likely negligible if recommended design and operating practices are implemented. BOEM (2021) would require wind farm developers to comply with current design guidance for avoiding and minimizing artificial lighting effects. On this basis, BOEM anticipates artificial lighting impacts from future wind farm development and other offshore activities would result in **negligible** adverse effects on marine mammals for the duration of the offshore activity.	**Offshore:** Construction of the RWF and RWEC would introduce mobile and intermittent artificial light sources on construction vessels. The RWF would also introduce stationary artificial light sources in the form of navigation, safety, and work lighting. Revolution Wind would follow BOEM (2021) guidance for construction and structural lighting and would use only the minimum type and amount of lighting required by regulation (see Table F-1 in Appendix F). Therefore, BOEM anticipates that short- to long-term lighting effects from RWF and RWEC construction, operations, and decommissioning on marine mammals would be **negligible** adverse for the Proposed Action. The effects of this IPF would be similar under Alternatives C through F but reduced in extent and to the duration of construction activities. The Proposed Action when combined with planned future activities would develop up to 3,110 offshore WTGs and OSS foundations in the geographic analysis area. The construction and O&M of these structures would introduce new short-term and long-term sources of artificial light to the offshore environment in the form of vessel lighting and navigation and safety lighting on the structures, respectively. Given the minimal and localized

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				nature of anticipated lighting effects, the cumulative effects from Alternatives B through F and existing and planned future activities on marine mammals would be **negligible** adverse, mostly attributable to existing, ongoing activities.
New cable emplacement/ maintenance	Cable maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances would be local and generally limited to the emplacement corridor. Data are not available regarding marine mammal avoidance of localized turbidity plumes; however, Todd et al. (2015) suggest that since some marine mammals often live in turbid waters and some species of mysticetes and sirenians employ feeding methods that create sediment plumes, some species of marine mammals have a tolerance for increased turbidity. Similarly, McConnell et al. (1999) documented movements and foraging of grey seals in the North Sea. One tracked individual was blind in both eyes but otherwise healthy. Despite being blind, observed movements were typical of the other study individuals, indicating that visual cues are not essential for grey seal foraging and movement (McConnell et al. 1999). If elevated turbidity caused any behavioral responses such as avoiding the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any impacts would be temporary and short term. Turbidity associated with increased sedimentation could result in temporary, short-term impacts on marine mammal prey species (see Table E2-4).	The FCC has two pending submarine telecommunication cable applications in the North Atlantic. The impact on water quality from accidental sediment suspension during cable emplacement is temporary and short term. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any negative impacts would be temporary and short term. Turbidity associated with increased sedimentation could result in temporary, short-term impacts on some marine mammal prey species (see Table E2-4).	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Noise: Aircraft	Aircraft routinely travel in the marine mammal geographic analysis area. With the possible exception of rescue operations, no ongoing aircraft flights would occur at altitudes that would elicit a response from marine mammals. If flights are at a sufficiently low altitude, marine mammals could respond with behavioral changes,	Future low-altitude aircraft activities such as surveys and navy training operations could result in short-term responses of marine mammals to aircraft noise. If flights are at a sufficiently low altitude, marine mammals could respond with behavior changes, including short surface durations, abrupt dives, and percussive behaviors (i.e.,	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	including short surface durations, abrupt dives, and percussive behaviors (i.e., breaching and tail slapping) (Patenaude et al. 2002). These brief responses would be expected to dissipate once the aircraft has left the area. Similarly, aircraft have the potential to disturb hauled out seals if aircraft overflights occur within 2,000 feet (610 m) of a haul out area (Efroymson et al. 2000). However, this disturbance would be temporary, short term, and result in minimal energy expenditure. These brief responses would be expected to dissipate once the aircraft has left the area.	breaching and tail slapping) (Patenaude et al. 2002). These brief responses would be expected to dissipate once the aircraft has left the area.		
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity impulsive noise around sites of investigation. These activities have the potential to result in high-intensity, high-consequence impacts, including auditory injuries, stress, disturbance, and behavioral responses, if present within the ensonified area (NOAA 2018). Survey protocols and underwater noise mitigation procedures are typically implemented to decrease the potential for any marine mammal to be within the area where sound levels are above relevant harassment thresholds associated with an operating sound source to reduce the potential for behavioral responses and injury (PTS/TTS) close to the sound source. The magnitude of effects, if any, is intrinsically related to many factors, including acoustic signal characteristics, behavioral state (e.g., migrating), biological condition, distance from the source, duration and level of the sound exposure as well as environmental and physical conditions that affect acoustic propagation (NOAA 2018).	Same as ongoing activities, with the addition of possible future oil and gas exploration surveys.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Noise: Turbines	Marine mammals would be able to hear the continuous underwater noise of operational WTGs. As measured at the BIWF, this low frequency noise barely exceeds ambient levels at 164 feet (50 m) from the WTG base. Based on the results of Thomsen et al. (2015) and Kraus et al. (2016), sound pressure levels would be expected to be at or below ambient levels at relatively short distances from the WTG foundations.	This sub-IPF does not apply to future non–offshore wind development.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water and/or through the seafloor can result in high-intensity, low-exposure level, long-term but localized, intermittent risk to marine mammals. Impacts would be localized in nearshore waters. Pile-driving activities could negatively affect marine mammals during foraging, orientation, migration, predator detection, social interactions, or other activities (Southall et al. 2007). Noise exposure associated	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	with pile-driving activities can interfere with these functions and have the potential to cause a range of responses, including insignificant behavioral changes, avoidance of the ensonified area, PTS, harassment, and ear injury, depending on the intensity and duration of the exposure. BOEM assumes that all ongoing and potential future activities would be conducted in accordance with a project-specific IHA to minimize impacts on marine mammals.			
Noise: Cable laying/trenching	N/A	Cable laying impacts resulting from future non–offshore wind activities would be identical to those described for future offshore wind projects.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Noise: Vessels	Ongoing activities that contribute to this sub-IPF include commercial shipping, recreational, and fishing vessels; scientific and academic research vessels; and other construction vessels. The frequency range for vessel noise falls within marine mammals' known range of hearing and would be audible. Noise from vessels presents a long-term and widespread impact on marine mammals across most oceanic regions. While vessel noise could have some effect on marine mammal behavior, it would be expected to be limited to brief startle and temporary stress response. Results from studies on acoustic impacts from vessel noise on odontocetes indicate that small vessels at a speed of 5 knots in shallow coastal water can reduce the communication range for bottlenose dolphins within 164 feet (50 m) of the vessel by 26% (Jensen et al. 2009). Pilot whales in a quieter deep-water habitat could experience a 50% reduction in communication range from a similar size boat and speed (Jensen et al. 2009). Since lower frequencies propagate farther away from the sound source compared to higher frequencies, low-frequency cetaceans are at a greater risk of experiencing Level B harassment produced by vessel traffic.	Any offshore projects that require the use of ocean vessels could result in long term but infrequent impacts on marine mammals, including temporary startle responses, masking of biologically relevant sounds, physiological stress, and behavioral changes. However, BOEM expects that these brief responses of individuals to passing vessels would be unlikely given the patchy distribution of marine mammals and no stock or population-level effects would be expected.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Port expansion activities are localized to nearshore habitats and are expected to result in temporary, short-term impacts, if any, on marine mammals. Vessel noise could affect marine mammals, but response would be expect to be temporary and short term (see Vessels: Noise sub-IPF above). The impacts on water quality from sediment suspension during port expansion activities is temporary, short term and would be similar to those described under the New cable emplacement/maintenance IPF above.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity would increase modestly. The ability of ports to receive the increase in larger ships would require port modifications. Future channel-deepening activities are being undertaken to accommodate deeper draft vessels for the Panama Canal locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for	The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Port improvements could lead to an increase in vessel traffic during construction (see Section 3.16), O&M, and decommissioning. The resulting change in vessel traffic in the geographic analysis area cannot be predicted because, while some ports have been identified as possibilities for expansion, no specific project plans have been proposed. Therefore, impacts would be **negligible** adverse. Any future port expansion and associated increase in vessel traffic would be subject to	Several regional ports could be used during Project construction, including ports in Baltimore, MD; New Bedford, MA; New London, CT; Norfolk, VA; Paulsboro, NJ; and Providence, RI, as well as Europe. The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects, but no specific improvements are included in Alternatives B through F. Any future port expansion would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential environmental effects. However, these localized habitat impacts are

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
		accidental discharges. The increased sediment suspension could be long term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future. Additional impacts associated with the increased risk of vessel strike could also occur (see the Traffic: Vessel collisions sub-IPF below).	independent NEPA analysis and regulatory approvals requiring full consideration of potential effects on marine mammals regionwide.	unlikely to affect marine mammals within the geographic analysis area. Therefore, port utilization impacts associated with the Project would be **negligible** adverse under all Project alternatives. Future actions, should they occur, could involve activities like dredging, increases in vessel activity and underwater noise, and the expansion or development of new structures. These activities could lead to adverse effects on coastal and estuarine habitats used by marine mammals and their prey species. These projects could result in cumulative effects on marine mammals, but the extent and significance of these effects cannot be evaluated because no project proposals have been developed. No port improvements have been proposed as part of Alternatives B through F and therefore cumulative impacts would be **negligible** adverse. The environmental effects resulting from any future port expansions would be evaluated in independent NEPA analysis, ESA and MMPA compliance documents, and other regulatory approvals for each project.
Presence of structures: Entanglement or ingestion of lost fishing gear	There are more than 130 artificial reefs in the Mid-Atlantic region. This sub-IPF could result in long-term, high-intensity impacts but with low exposure due to localized and geographic spacing of artificial reefs. Currently bridge foundations and the BIWF could be considered artificial reefs and could have higher levels of recreational fishing, which increases the chances of marine mammals encountering lost fishing gear, resulting in possible ingestions, entanglement, injury, or death of individuals (Moore and van der Hoop 2012), if present nearshore where these structures are located. There are very few, if any, areas within the OCS geographic analysis area for marine mammals that would serve to concentrate recreational fishing and increase the likelihood that marine mammals would encounter lost fishing gear.	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Presence of structures: Habitat conversion and prey aggregation	There are more than 130 artificial reefs in the Mid-Atlantic region. Hard-bottom (scour control and rock mattresses) and vertical structures (bridge foundations and BIWF WTGs) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (NMFS 2015; Taormina et al. 2018). The reef effect is usually considered a beneficial impact, associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for seals and small odontocetes compared to the surrounding soft bottoms.	The presence of structures associated with non–offshore wind development in nearshore coastal waters has the potential to provide habitat for seals and small odontocetes as well as preferred prey species. This reef effect has the potential to result in long-term, low-intensity benefits. Bridge foundations would continue to provide foraging opportunities for seals and small odontocetes with measurable benefits to some individuals. Hard-bottom (scour control and rock mattresses used to bury the offshore export cables) and vertical structures (i.e., WTG and ESP foundations) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (Causon and Gill 2018; Taormina	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
		et al. 2018). The reef effect is usually considered a beneficial impact, associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for marine mammals compared to the surrounding soft bottoms.		
Presence of structures: Avoidance/Displacement	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF. There could be some impacts resulting from the existing BIWF, but given that there are only five WTGs, no measurable impacts are occurring.	Not contemplated for non–offshore wind facility sources.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Presence of structures: Behavioral disruption (breeding and migration)	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non–offshore wind facility sources.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Presence of structures: Displacement into higher risk areas (vessels and fishing)	No ongoing activities in the marine mammal geographic analysis area beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non–offshore wind facility sources.	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.
Traffic: Vessel collisions	Current activities that are contributing to this sub-IPF include port traffic levels, fairways, traffic separation schemes, commercial vessel traffic, recreational and fishing activity, and scientific and academic vessel traffic. Vessel strike is relatively common with cetaceans (Kraus et al. 2005) and one of the primary causes of death to NARWs, with as many as 75% of known anthropogenic mortalities of NARWs likely resulting from collisions with large ships along the U.S. and Canadian eastern seaboard (Kite-Powell et al. 2007). Marine mammals are more vulnerable to vessel strike when they are within the draft of the vessel and beneath the surface and not detectable by visual observers. Some conditions that make marine mammals less detectable include weather conditions with poor visibility (e.g., fog, rain, wave height) or nighttime operations. Vessels operating at speeds exceeding 10 knots have been associated with the highest risk for vessel strikes of NARWs (Vanderlaan and Taggart 2007). Reported vessel collisions with whales show that serious injury rarely occurs at speeds below 10 knots (Laist et al. 2001). Data show that the probability of a vessel strike increases with the velocity of a vessel (Pace and Silber 2005; Vanderlaan and Taggart 2007).	Vessel traffic associated with non–offshore wind development has the potential to result in an increased collision risk. While these impacts would be high consequence, the patchy distribution of marine mammals makes stock or population-level effects unlikely (Navy 2018).	See Section 3.15.1.1 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on benthic habitat and are not analyzed.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of offshore impacts. Onshore Project activities would not result in impacts to marine resources. Therefore, IPFs associated with onshore activities would have no measurable effect on marine mammals and are not analyzed.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Sediment deposition and burial	The USACE and/or private ports could undertake dredging projects periodically. Where dredged materials are disposed, marine species could be affected. However, such areas are typically recolonized naturally in the short term. Most species in the geographic analysis area are adapted to the turbidity and periodic sediment deposition that occur naturally in the geographic analysis area.	No future activities were identified within the geographic analysis area for marine mammals other than ongoing activities.	Seafloor disturbance during the installation of transmission cables, sea-to-shore transition construction, and dredging activities would result in elevated suspended sediment concentrations in the water column. Based on modeled and observed TSS impacts for the Proposed Action and other regional wind farm projects (Elliot et al. 2017; RPS 2021; Vinhateiro et al. 2018), and maximum water column TSS concentrations could range from several hundred to several thousand mg/L in close proximity to the disturbance and would dissipate below 100 mg/L, usually within minutes to hours of the disturbance, depending on the types of sediments affected. In locations with predominantly sand or coarser sediments, water column effects would be limited to short-term TSS pulses below 100 mg/L extending a few hundred feet downcurrent within approximately 20 feet of the seafloor and dissipating to background conditions within approximately 1 to 2 hours after disturbance. Available information on marine mammal sensitivity to TSS indicates that water quality impacts would have negligible effects on marine mammals. First, periodic TSS concentrations on the order of 100 mg/L at or near the seafloor are within the range of baseline variability. Marine mammals that forage on or near the seafloor are unlikely to be affected by a short-term increase in TSS that is comparable to existing conditions. For example, researchers have observed that visually impaired grey and harbor seals are able to navigate and locate prey just as effectively as their fully sighted counterparts (McConnell et al. 1999; Newby et al. 1970; Todd et al. 2015), indicating that short-term visual impairment would have no measurable effect on foraging ability. While research on TSS sensitivity in dolphins and large whales is generally lacking, these species developed the ability to echolocate by evolving in environments having variable and often low visibility (Tyack and Miller 2002). This suggests that a short-term reduction in visibility would have no effect on communication, foraging success, and predator avoidance and would not result in displacement or other observable changes in behavior. These factors indicate that marine mammal exposure to water quality effects resulting from construction of future offshore wind farms would be limited. Those species that are exposed to elevated TSS would be unlikely to experience measurable effects on behavior, foraging success, or communication. On this basis, water quality effects on marine mammals resulting from future offshore	RPS (2021) modeled the magnitude and extent of anticipated TSS concentrations resulting from RWF and RWEC construction. Maximum water column TSS concentrations could exceed 500 mg/L in close proximity to the disturbance. The majority of water column effects would be limited to short-term TSS pulses below 100 mg/L, occurring in plumes extending approximately 6 to 20 feet off the seafloor and 580 to 4,134 feet downcurrent. Dredging used to level the seabed and achieve greater burial depths for RWEC installation would produce TSS plumes with concentrations up to 100 mg/L extending from the seabed to the surface extending from 3,067 to 5,838 feet downcurrent. In most locations, TSS concentrations would dissipate to background conditions within approximately 1 to 2 hours after disturbance; however, in selected locations—specifically at the sea-to-shore transition construction area—TSS concentrations greater than 100 mg/L could linger for up to 36 hours. These modeled estimates are similar to those developed for BIWF construction. The observed extent of TSS impacts at the BIWF turned out to be considerably lower than the modeled estimates (Elliot et al. 2017), indicating that the potential impacts described here are likely conservative. Both the modeled TSS effects, which are conservatively high, and the observed TSS effects were short term and within the range of baseline variability. Based on available information (see No Action Alternative at left) a short-term reduction in visibility would have no meaningful effects on communication, foraging, and predator avoidance, particularly given that measurable TSS impacts would be limited to within 10 to 12 feet of the seafloor in the open ocean waters where marine mammals are most likely to occur. These factors indicate that marine mammal exposure to water quality effects resulting from construction of all Project alternatives would be **negligible** adverse under Alternatives B through F because of the limited sensitivity of marine mammals to TSS and the temporary nature of the impact. Alternatives C through F would result in a shorter overall length of IAC installation, proportionally reducing the extent and duration of suspended sediment impacts relative to the Proposed Action. Those species that are exposed to elevated TSS would be unlikely to experience measurable effects on behavior, foraging success, or communication. Seafloor disturbance during O&M activities would be limited under all Project alternatives, but reduced in extent under Alternatives C through F. As noted above,

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			wind farm construction would be **negligible** adverse and short term in duration.	the cables are unlikely to require repair or maintenance, but up to 10% of cable protection could need to be replaced over the life of the Project. Replacement of the cable protection could result in localized, temporary increases in TSS. However, consistent with impacts of cable installation, suspended sediment plumes would be limited to within 10 to 12 feet of the seafloor in the open ocean waters where marine mammals are most likely to occur. Potential effects of removal of the cable during decommissioning would be similar in nature to those anticipated for cable installation or replacement of cable protection. Thus, sediment deposition and burial effects on marine mammals resulting from Project O&M and decommissioning under Alternatives B through F would be temporary **negligible** adverse. BOEM estimates a cumulative total of up to 30,885 acres of seafloor disturbance for Alternatives B through F plus all other future offshore wind projects in the geographic analysis area. As discussed above, TSS effects on marine mammals are likely to be negligible adverse because of limited potential exposure to elevated TSS. No population-level effects on marine mammals are expected from reduced water quality. Therefore, Alternatives B through F when combined with past, present, and reasonably foreseeable activities would result in **negligible** adverse cumulative effects on marine mammals.
Climate change: Warming and sea level rise, storm severity/ frequency	Increased storm frequency could result in increased energetic costs for marine mammals and reduced fitness, particularly for juveniles, calves, and pups.	No future activities were identified within the geographic analysis area for marine mammals other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.
Climate change: Ocean acidification	This sub-IPF has the potential to lead to long-term, high-consequence impacts on marine ecosystems by contributing to reduced growth or decline of invertebrates that have calcareous shells.	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.
Climate change: Warming and sea level rise, altered habitat/ecology	This sub-IPF has the potential to lead to long-term, high-consequence impacts on marine mammals as a result of changes in distribution, reduced breeding and/or foraging habitat availability, and disruptions in migration.	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.
Climate change: Warming and sea level rise, altered migration patterns	This sub-IPF has the potential to lead to long-term, high-consequence impacts on marine mammal habitat use and migratory patterns. For example, the NARW appears to be migrating differently and feeding in different areas in response to changes in prey densities related to climate change (MacLeod 2009; Nunny and Simmonds 2019; Record et al. 2019).	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Climate change: Warming and sea level rise, increased disease frequency	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters, influencing the frequencies of various diseases of marine mammals, such as Phocine distemper. Climate change is clearly influencing infectious disease dynamics in the marine environment; however, no studies have shown a definitive causal relationship between any components of climate change and increases in infectious disease among marine mammals. This is due in large part to a lack of sufficient data and the likely indirect nature of climate change's impact on these diseases. Climate change could affect the incidence or prevalence of infection, the frequency or magnitude of epizootics, and/or the severity or presence of clinical disease in infected individuals. There are a number of potential proposed mechanisms by which this might occur (see summary in Burge et al. 2014).	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.
Climate change: Warming and sea level rise, storm severity/frequency, sediment erosion, deposition	Increased storm frequency could result in increased energetic costs for marine mammals, reduced fitness, particularly for juveniles, calves, and pups. Erosion could impact seal haul outs, reducing their habitat availability, especially as sea walls and other obstructions are added, blocking seals access to shore.	No future activities were identified within the marine mammal geographic analysis area other than ongoing activities.	See Section 3.15.1.1 for analysis.	See Sections 3.15.2.2 and 3.15.2.3 for analysis of impacts.

Sea Turtles

Table E2-6. Summary of Activities and the Associated Impact-Producing Factors for Sea Turtles

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a quantitative analysis of these risks. Ongoing releases are frequent and chronic. Sea turtle exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality (Shigenaka et al. 2010) or sublethal effects on individual fitness, including adrenal effects, dehydration, hematological effects, increased disease incidence, liver effects, poor body condition, skin effects, skeletomuscular effects, and several other health effects that can be attributed to oil exposure (Bembenek-Bailey et al. 2019; Camacho et al. 2013; Mitchelmore et al. 2017; Shigenaka et al. 2010; Vargo et al. 1986). Additionally, accidental releases could result in impacts on sea turtles due to effects on prey species (see Table E2-4).	See Table E1-4 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Sea turtle exposure to aquatic contaminants and inhalation of fumes from oil spills can result in mortality (Shigenaka 2010; Wallace et al. 2010) or sublethal effects on individual fitness, including adrenal effects, dehydration, hematological effects, increased disease incidence, liver effects, poor body condition, skin effects, skeletomuscular effects, and several other health effects that can be attributed to oil exposure (Bembenek-Bailey et al. 2019; Camacho et al. 2013; Mitchelmore et al. 2017; Shigenaka et al. 2010; Vargo et al. 1986). Additionally, accidental releases could result in impacts on sea turtles due to effects on prey species (see Table E2-4).	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Accidental releases: Trash and debris	Trash and debris could be accidentally discharged through fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey	Trash and debris could be accidentally discharged through fisheries use; dredged material ocean disposal; marine minerals extraction; marine transportation; navigation and traffic; survey	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	activities; cable, line, and pipeline laying; and debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low quantity, local, and low-impact events. Direct ingestion of plastic fragments is well documented and has been observed in all species of sea turtles (Bugoni et al. 2001; Hoarau et al. 2014; Nelms et al. 2016; Schuylar et al. 2014). In addition to plastic debris, ingestion of tar, paper, Styrofoam™, wood, reed, feathers, hooks, lines, and net fragments have also been documented (Thomás et al. 2002). Ingestion can also occur when individuals mistake debris for potential prey items (Gregory 2009; Hoarau et al. 2014; Thomás et al. 2002). Potential ingestion of marine debris varies among species and life history stages due to differing feeding strategies (Nelms et al. 2016). Ingestion of plastics and other marine debris can result in both lethal and sublethal impacts on sea turtles, with sublethal effects more difficult to detect (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). Long-term sublethal effects could include dietary dilution, chemical contamination, depressed immune system function, and poor body condition as well as reduced growth rates, fecundity, and reproductive success. However, these effects are cryptic, and clear causal links are difficult to identify (Nelms et al. 2016).	activities; cable, line, and pipeline laying; and debris carried in river outflows or windblown from onshore. Accidental releases of trash and debris are expected to be low quantity, local, and low-impact events. Direct and indirect ingestion of plastic fragments and other marine debris is well documented and has been observed in all species of sea turtles (Bugoni et al. 2001; Gregory 2009; Hoarau et al. 2014; Nelms et al. 2016; Schuylar et al. 2014; Thomás et al. 2002). Ingestion can result in both lethal and sublethal impacts on sea turtles, with sublethal effects more difficult to detect (Gall and Thompson 2015; Hoarau et al. 2014; Nelms et al. 2016; Schuyler et al. 2014). However, these effects are cryptic, and clear causal links are difficult to identify (Nelms et al. 2016).		
Anchoring	Vessel anchoring related to ongoing military use and survey, commercial, and recreational activities continues to cause temporary to permanent impacts in the immediate area where anchors and chains meet the seafloor.	Impacts from anchoring could occur on a semiregular basis over the next 30 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. These impacts would include increased turbidity levels and potential for contact causing mortality of sea turtles. All impacts would be localized; turbidity would be temporary; impacts from contact would be recovered in the short term.	Future offshore wind projects could disturb up to 2,672 acres of seafloor from anchoring/mooring activities and the installation of associated undersea cables during offshore wind energy development, causing an increase in suspended sediment. This disturbance would be both localized and temporary in duration. Entanglement risks to sea turtles from vessel anchoring and cable emplacement are not anticipated. Only larger construction and O&M vessels would anchor to the seafloor, using large heavy anchor chains. No lines or rigging are anticipated for cable installation, and transmission cables and jet plow umbilicals are large in diameter, relatively inflexible, and under constant tension. The likelihood of sea turtle entanglement under these conditions is discountable. In general, impacts to benthic habitats are unlikely to directly affect sea turtles but could indirectly affect these species through impacts on their prey. As discussed in Section 3.6, BOEM anticipates that impacts to benthic habitats and invertebrates would likely range from minor to moderate adverse. Certain sea turtle species, such as loggerheads, that feed on benthic invertebrates could experience short-term reductions in prey availability that are limited in extent, potentially offset by long-term increases in prey abundance from maturing reef effects. Thus, effects of anchoring and new cable emplacement/maintenance on sea turtles under the No Action Alternative would be **negligible** adverse.	Offshore: Sea turtles near the Project would likely be foraging, and prey items could include benthic species affected by vessel anchoring and cable emplacement/maintenance. The associated disturbance would be temporary; however, some benthic habitat conversion would also occur, as described in in Section 3.6. Project construction and installation would temporarily affect up to 6,632 acres of available foraging habitat until preconstruction species assemblages are recolonized and recovered. Benthic communities that inhabit dynamic bed (i.e., soft-bottom) habitats typically recover rapidly from construction-related disturbance, usually within 1 year (Dernie et al. 2003; UKBERR 2008), while some organisms associated with complex benthic habitat, like sponges and hydroids, could take a decade or longer to fully recover (Auster and Langton 1999; Collie et al. 2005; Lukens and Selberg 2004; Tamsett et al. 2010). The affected area is also subject to periodic bed disturbance by commercial fishing (CH2M HILL 2018), indicating that construction-related bed disturbance is not expected to measurably alter environmental baseline conditions. Because impacts to foraging habitat are mostly temporary and localized, the impact of Project activities associated with seafloor disturbance on sea turtles would be **negligible** adverse under Alternatives B through F but incrementally reduced under Alternatives C through F (a comparison of the benthic habitat disturbance footprints

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				under the different configurations of Alternatives C through E and the Proposed Action is provided in Table 3.6-8, Table 3.6-9, and Table 3.6-10 in Section 3.6). Entanglement risks to sea turtles from vessel anchoring and cable emplacement are not anticipated. Only larger construction and O&M vessels would anchor to the seafloor, using large heavy anchor chains. Per the COP, no divers would be used and no lines or rigging are anticipated for cable installation and maintenance. Transmission cables and jet plow umbilicals are large in diameter, relatively inflexible, and under constant tension throughout installation. Potential anchoring impacts during O&M and decommissioning would be similar to the construction phase but reduced due to fewer anchored vessels. As stated in Section 3.5.2 of the COP, the Project does not anticipate that the IAC, OSS-link cable, and RWEC would require significant maintenance. The cables themselves are unlikely to require repair, but up to 10% of cable protection could need to be replaced over the life of the Project. Effects to sea turtles from cable protection maintenance would result primarily from underwater noise, disturbance, and collision risk associated with O&M vessel activity. The IAC, OSS-link cable, and RWEC would be removed from the seafloor during Project decommissioning. Alternatives C through F would result in a reduced total length of IAC and a reduced extent of anchoring impacts relative to the Proposed Action. This would incrementally reduce the extent of O&M- and decommissioning-related impacts on sea turtles resulting from Project construction and would therefore be **negligible** adverse under Alternatives B through F because of the temporary and localized nature of the potential impacts. BOEM estimates a cumulative total of 5,803 acres of anchoring and mooring-related disturbance and 25,082 acres of cabling-related disturbance for the Proposed Action combined with all other future offshore wind projects within the geographic analysis area. Impacts from Alternatives C through F would be reduced in extent than the Proposed Action. The duration and magnitude of these effects would vary depending on the types of habitats impacted. Impacts on soft-bottom benthic habitats and associated sea turtle forage species would be expected to fully recover within 18 to 24 months, whereas impacts on complex benthic habitats could take a decade or more to fully recover. While increases in foraging effort or displacement due to turbidity could occur to individual sea turtles, these temporary effects are not anticipated to

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				lead to population-level effects on sea turtle populations. Vessel anchoring and cable emplacement during construction, O&M, and decommissioning are not anticipated to involve equipment, lines, or rigging that could pose a potential entanglement risk to sea turtles. Therefore, Alternatives B through F when combined with past, present, and reasonably foreseeable projects would result in **negligible** adverse cumulative impacts to sea turtles.
			Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.
Bycatch	Impacts from bycatch are a primary threat to sea turtles (NOAA 2018). A reduction in bycatch has been achieved by the requirement for the use of bycatch mitigation measures. A comparison pre- versus post-regulation mean annual bycatch data for Mid-Atlantic fisheries (otter trawl, gillnet, scallop trawl, scallop dredge, Virginia pound net) showed sea turtle bycatch was reduced from 2,400 incidents to 1,700 and mortality was reduced from 1,000 to 470 based on data over the period 1990 to 2007 (Finkbeiner et al. 2011). In the Atlantic, bycatch occurs in various gillnet and trawl fisheries in New England and the Mid-Atlantic coast, with hotspots driven by marine mammal density and fishing intensity (Lewison et al. 2014; NMFS 2018a).	No future activities were identified within the geographic analysis area for this resource other than ongoing activities	A range of monitoring activities has been proposed to evaluate the short-term and long-term effects of existing and planned offshore wind development on biological resources and are also likely for future wind energy projects on the OCS. Some of these monitoring activities are likely to affect sea turtles through the potential for bycatch and/or injury by sample collection gear. Biological monitoring uses the same types of methods and equipment employed in commercial fisheries, meaning that impacts to sea turtles would be similar in nature but reduced in extent in comparison to impacts from current and likely future fishing activity. Monitoring activities are commonly conducted by commercial fishers under contract who would otherwise be engaged in fishing activity. As such, research and monitoring activities related to offshore wind would not necessarily result in an increase in bycatch-related impacts on sea turtles, although the distribution of those impacts could change. Therefore, any bycatch-related impacts on invertebrates would be **negligible to minor** adverse and short term in duration.	Revolution Wind is proposing to implement the FRMP as part of Alternatives B through F (Revolution Wind and Inspire Environmental 2021). The FRMP employs a variety of survey methods to evaluate the effect of RWF construction and operation on benthic habitat structure and composition and on marine species. The following survey methods could impact sea turtles: Ventless trap surveys to evaluate changes in the distribution and abundance of lobster and Jonah crab in the RWF and adjacent reference areas and Jonah crab, lobster, whelk (Buccinidae), and finfish along the RWEC corridor and adjacent reference areas; these areas would be surveyed 12 times per month for 7 months each for 2 years prior to and at least 2 years following completion of Project construction (4 years total) Otter trawl surveys to assess abundance and distribution of target fish and invertebrate species within the RWF trawls could impact a variety of invertebrate species as bycatch and would occur four times per year for 2 years prior to and at least 2 years following completion of Project construction. These surveys involve similar methods to and would complement other survey efforts conducted by various state, federal, and university entities supporting regional fisheries research and management. Survey fisheries gear (otter trawls, ventless traps, and the anchoring lines and buoys used to secure acoustic telemetry equipment) could pose an entanglement risk to sea turtles. However, this risk must be considered in the context of ongoing commercial fisheries activity. The

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				FRMP would contract commercial fishing vessels to conduct surveys, using commonly available commercial fishing gear. These contract vessels would likely be engaged in the commercial fishery if not involved in the FRMP, at least at an equivalent, if not greater, level of fishing effort. Therefore, the FRMP would not be likely to measurably change the quantity of fishing gear on the mid-Atlantic OCS or the amount of fishing effort that sea turtles are exposed to by gear type. Moreover, the FRMP would adhere to risk reduction measures such as no fishing monitoring gear would be in wet storage; no buoy lines would float at the surface; all sampling gear would be hauled at least once every 30 days; all gear would be removed from the water at the end of each sampling season; all groundlines would be constructed of sinking line; and knot-free buoy lines would be encouraged. When considered in combination, the anticipated impacts of the FRMP on sea turtles are anticipated to be **negligible** adverse. Acoustic telemetry receiver systems pose a negligible risk of harm to sea turtles. Based on the type of equipment, deployment near the seafloor, and the small number of receivers deployed (up to 19 in total) over a large area, BOEM considers the effects of this Project element on sea turtles to be **negligible** adverse. Similarly, moored and autonomous PAM systems would use the best available technology to avoid and minimize impacts on the environment. Based on their size and configuration of their mooring systems, PAM buoys pose an insignificant entanglement risk to sea turtles. Therefore, the effects of this type of survey equipment on sea turtles would likewise be **negligible** adverse under Alternatives B through F.
EMFs	EMFs emanate constantly from installed telecommunication and electrical power transmission cables. Sea turtles appear to have a detection threshold of magnetosensitivity and behavioral responses to field intensities ranging from 0.0047 to 4000 µT for loggerhead turtles, and 29.3 to 200 µT for green turtles, with other species likely similar due to anatomical, behavioral, and life history similarities (Normandeau et al. 2011). Juvenile or adult sea turtles foraging on benthic organisms could be able to detect magnetic fields while they are foraging on the bottom near the cables and up to potentially 82 feet (25 m) in the water column above the cable. Juvenile and adult sea turtles could detect the EMF over relatively small areas near cables (e.g., when resting on the bottom or foraging on benthic organisms near cables or concrete mattresses). There are no data on impacts on sea turtles from EMFs generated by underwater cables, although	During operations, future new cables would produce EMF. Submarine power cables in the geographic analysis area for sea turtles are assumed to be installed with appropriate shielding and burial depth to reduce potential EMF to low levels (BOEM 2007: Section 5.2.7). EMF of any two sources would not overlap. Although the EMF would exist as long as a cable was in operation, impacts, if any, would likely be difficult to detect, if they occur at all. Further, this IPF would be limited to extremely small portions of the areas used by resident or migrating sea turtles. As such, exposure to this IPF would be low, and as a result, impacts on sea turtles would not be expected.	Under the No Action Alternative, the future development of planned wind energy projects would result in up to 10,024 miles of new submarine electrical transmission cables in the geographic analysis area for sea turtles. Each cable would generate EMF effects within the immediate proximity. The available evidence indicates that sea turtles are magnetosensitive and orient to the Earth's magnetic field for navigation. Although they could be able to detect magnetic fields as low as 0.05 mG, they are unlikely to detect magnetic fields below 50 mG (Normandeau et al. 2011; Snoek et al. 2016). Potential EMF effects would be reduced by cable shielding and burial to an appropriate depth (typically 4–6 feet). Standard design guidance for offshore wind energy transmission cable installation avoids cable crossings where practicable and recommends maintaining a minimum separation of at least several hundred feet between Project	**Offshore:** There would be no EMF produced during construction of the offshore Project structures. The Project would generate EMF along the length of the IACs and offshore RWEC for the life of the Project until decommissioning. These effects would be most intense at locations where the RWEC cannot be buried and is laid on the bed surface covered by a stone or concrete armoring blanket. Approximately 8.8 miles of the RWEC cable, 0.9 mile of the OSS-link, and 15.5 miles of the IAC could be unburied and would require surface armoring. Exponent (2021) modeled EMF levels that could be generated by the RWEC, OSS-link cable, and IAC. It estimated induced magnetic field levels ranging from 147 to 1,071 mG on the bed surface above the buried and exposed RWEC and OSS-link cable and 57 to 522 mG above the IAC (see Section

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	anthropogenic magnetic fields can influence migratory deviations (Luschi et al. 2007; Snoek et al. 2016). However, any potential impacts from AC cables on turtle navigation or orientation would likely be undetectable under natural conditions and thus would be insignificant (Normandeau et al. 2011).		features and existing transmission and communication cables to avoid damaging existing infrastructure and for safety during installation (CSRIC 2014; Sharples 2011; TÜV SÜD PMSS 2014). This separation distance would also avoid additive EMF effects from adjacent cables. Although artificial EMF effects on sea turtles are not well studied, the affected areas would be localized around unburied cable segments and limited to within 3 to 7.5 m of the cable surface (CSA Ocean Sciences Inc. and Exponent 2019). Deviations in migration therefore would have a negligible impact on energy expenditure in sea turtles. EMF effects from future offshore wind development would similarly be **negligible** adverse because of the limited anticipated exposure.	3.6). Induced field strength would decrease rapidly with distance from the source, dropping below 100 mG within 3.3 feet of the seafloor directly above the cable. Induced magnetic field strength would fall effectively to 0 mG within 25 feet of the centerline of each cable segment. The only exception would occur at the RWEC landing location, where the two cable corridors would approach to within 10 feet. Measurable magnetic field effects would extend between 25 to 50 feet from the outer edge of the combined cable path. BOEM has conducted literature reviews and analyses of potential EMF effects from offshore renewable energy projects (CSA Ocean Sciences Inc. 2021; Inspire Environmental 2019; Normandeau et al. 2011). These and other available reviews and studies (Gill et al. 2005; Kilfoyle et al. 2018) suggest that most marine species cannot sense very low-intensity electric or magnetic fields at the typical AC power transmission frequencies associated with offshore renewable energy projects. 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 RWEC and IACs would be buried 4 to 6 feet 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 feet. 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 3.3 feet (1 m) of the seafloor, except for RWEC cable segments lying on the bed surface. This indicates that turtles would only be able to detect induced magnetic fields within a few feet of cable segments lying on the bed surface. These cable segments would be relatively short (less than 100 feet long) and widely dispersed. Exponent (2021) 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

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				EMF exposure on sea turtles would be **negligible** adverse for the life of the Project for the Proposed Action. Alternatives C through F would result in similar EMF impacts to those described for the Proposed Action, but those impacts would be reduced in extent and the total area exposed would vary depending on the alternative and configuration selected (see Tables 3.6-23, 3.6-24, and 3.6-25 in Section 3.6). Heat from the buried RWEC and IACs could affect some benthic organisms that represent forage for turtles, but little is known about the potential change to substrate temperatures that transmission cables might have on the benthos (Taormina et al. 2018). Benthic effects are not expected to impact leatherback turtles as benthic prey are not typically included in their diet. Effects to algal cover (green sea turtle forage) and crustaceans, gastropods, crabs, and bivalves (loggerhead sea turtle forage) could conceivably affect sea turtle foraging opportunities. However, because cables would be buried to a depth of 4 to 6 feet and/or covered with concrete protection, changes in temperature of the substrate at the surface of the seafloor is not anticipated to increase markedly. The potential effects of cable heat to the availability of turtle forage would be **negligible** adverse under Alternatives B through F. Project EMF effects would combine with those generated by the 10,024 miles of new and existing transmission cables from the other new offshore wind facilities planned on the mid-Atlantic OCS as well as other existing transmission cables. Submarine power cables would be installed with appropriate shielding and at a burial depth to reduce potential EMF at the substrate surface. The RWEC and IACs would maintain a minimum separation of at least several hundred feet from other known cables to avoid inadvertent damage during installation and additive EMF effects from adjacent cables (CSRIC 2014; Sharples 2011; TÜV SÜD PMSS 2014). Additionally, exposure to detectable levels of EMF would be limited to within 25 feet of the small number of areas where cable segments cannot be buried to the anticipated depth. This represents an extremely small percentage of the geographic analysis area for sea turtles and is unlikely to lead to biologically significant effects on sea turtle movement, migration, or foraging patterns. Therefore, the cumulative impacts associated with Alternatives B through F when combined with past, present, and reasonably foreseeable activities would represent a long-term **negligible** adverse impact on sea turtles.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				Onshore: Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.
Light: Vessels	Ocean vessels such as ongoing commercial vessel traffic, recreational and fishing activity, and scientific and academic research traffic have an array of lights, including navigational, deck, and interior lights. Such lights have some limited potential to attract sea turtles, although the impacts, if any, are expected to be localized and temporary.	Construction, operations, and decommissioning vessels associated with non–offshore wind activities produce temporary and localized light sources that could result in the attraction or avoidance behavior of sea turtles. These short-term impacts are expected to be of low intensity and occur infrequently.	**Offshore:** Nighttime 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 geographic analysis area, 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 geographic analysis area, including a temporary increase in light from vessels used during construction and the long-term use of navigational lighting on new WTGs and OSSs. An estimated 3,008 foundations are forecasted for future wind energy construction. Each structure would have minimal white flashing navigational lighting as well as red flashing FAA hazard lights in accordance with BOEM’s (2021) lighting and marking guidelines. Although the potential effects of offshore lighting on juvenile and adult sea turtles is uncertain, WTG lighting is anticipated to have a **negligible** adverse effect on sea turtles based on the lack of observed effects on sea turtles from decades of oil and gas platform operations in the Gulf of Mexico, which can have considerably more lighting than offshore WTGs (BOEM 2021).	**Offshore:** Lights would be 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 RWF and RWEC. Gless et al. (2008) reported 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. Project EPMs (see Table F-1 in Appendix F) stipulate that construction vessel lightingwould be limited to the minimum necessary to ensure safety and to comply with applicable regulations. Additionally, BOEM (2021) has issued design guidance for avoiding and minimizing artificial lighting impacts from offshore energy facilities and associated construction vessels and has concluded that adherence to these measures should effectively avoid adverse effects on sea turtles. Considering the EPMs and the fact that construction vessel activity is unlikely to measurably alter baseline vessel light levels, temporary construction lighting effects on sea turtles would be **negligible** adverse. The RWF would include a variety of operational lighting, including navigational lighting for mariners, obstruction lighting for aviators, and vessel/work lighting for O&M (BOEM 2021). Orr et al. (2013) indicated that lights on wind generators flash intermittently for navigation or safety purposes and do not present a continuous light source. Limpus (2006) suggested that intermittent flashing lights with a very short “on” pulse and long “off” interval are nondisruptive to marine turtle behavior, irrespective of the color. Limpus (2006) also indicated 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.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				Sea turtles' typical behavior of remaining predominantly submerged would additionally limit the exposure of individuals to operational lighting. BOEM (2021) has issued design guidance for avoiding and minimizing artificial lighting impacts from offshore energy facilities and has concluded that adherence to these measures should effectively avoid adverse effects on fish. RWF adherence to design guidelines would ensure operational lighting effects on sea turtles would be minimal, temporary, and therefore **negligible** adverse. The Proposed Action would result in negligible incremental impacts to sea turtles through the installation of 102 lighted structures (100 WTGs and two OSSs). This represents approximately 3% of the projected increase in offshore lighting projected under the No Action Alternative. BOEM estimates a cumulative total of 3,110 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the geographic analysis area. All future wind farm projects would be expected to follow BOEM design guidance for lighting of offshore structures and avoiding and minimizing artificial lighting impacts from offshore energy facilities and associated construction vessels (BOEM 2021; Orr et al. 2013). Adherence to these measures should effectively avoid adverse effects on aquatic organisms. BOEM would require all future offshore energy projects to comply with this guidance. Nighttime lighting associated with offshore structures and vessels could represent a source of attraction, avoidance, or other behavioral responses in sea turtles. However, BOEM assumes that all offshore wind projects would be sited offshore, away from nesting beaches, and would not disorient nesting females or hatchling sea turtles. Because other planned and potential future offshore wind energy projects would be expected to adhere to the same measures to avoid adverse lighting impacts, the Proposed Action when combined with past, present, and reasonably foreseeable activities would also represent a **negligible** adverse cumulative impact on sea turtles. Alternatives C through F would include the same, or similar, extent of light emissions as those described for the Proposed Action but would be reduced based on the reduction in the number of WTGs and other operational lighting elements, resulting in a **negligible** adverse impact. Project lighting represents no more than a 3% projected increase in offshore lighting compared to the No Action Alternative. BOEM estimates a cumulative total of 3,066 to 3,103 offshore WTGs and OSS foundations for Alternatives C through F plus all other future offshore

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				wind projects in the geographic analysis area. Thus, the impacts of operational lighting are also considered **negligible** adverse.
			Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment regardless of alternative. Therefore, impacts of onshore activities and facilities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.
Light: Structures	Artificial lighting on nesting beaches or in nearshore habitats has the potential to result in disorientation to nesting females and hatchling turtles. Artificial lighting on the OCS does not appear to have the same potential for effects. Decades of oil and gas platform operations in the Gulf of Mexico, which can have considerably more lighting than offshore WTGs, has not resulted in any known impacts on sea turtles (BOEM 2021).	Non-offshore wind activities would not be expected to appreciably contribute to this sub-IPF. As such, no impact on sea turtles would be expected.	See Light: Vessels above for offshore and onshore analysis.	See Light: Vessels above for offshore and onshore analysis.
New cable emplacement/ maintenance	Cable maintenance activities disturb bottom sediments and cause temporary increases in suspended sediment; these disturbances would be local and generally limited to the emplacement corridor. Data are not available regarding effects of suspended sediments on adult and juvenile sea turtles, although elevated suspended sediments could cause individuals to alter normal movements and behaviors. However, these changes are expected to be too small to be detected (NOAA 2020b). Sea turtles would be expected to swim away from the sediment plume. Elevated turbidity is most likely to affect sea turtles if a plume causes a barrier to normal behaviors, but no impacts would be expected due to swimming through the plume (NOAA 2020b). Turbidity associated with increased sedimentation could result in short-term, temporary impacts on sea turtle prey species (see Table E2-4).	The FCC has two pending submarine telecommunication cable applications in the North Atlantic. The impact on water quality from accidental sediment suspension during cable emplacement is short term and temporary. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any impacts would be short term and temporary. Turbidity associated with increased sedimentation could result in short-term, temporary impacts on some sea turtle prey species (see Table E2-4).	See Anchoring above for offshore and onshore analysis.	See Anchoring above for offshore and onshore analysis.
Noise: Aircraft	Aircraft routinely travel in the geographic analysis area for sea turtles. With the possible exception of rescue operations, no ongoing aircraft flights would occur at altitudes that would elicit a response from sea turtles. If flights are at a sufficiently low altitude, sea turtles could respond with a startle response (diving or swimming away), altered submergence patterns, and a temporary stress response (NSF and USGS 2011; Samuel et al. 2005). These brief responses would be expected to dissipate once the aircraft has left the area.	Future low-altitude aircraft activities such as surveys and navy training operations could result in short-term responses of sea turtles to aircraft noise. If flights are at a sufficiently low altitude, sea turtles could respond with a startle response (diving or swimming away), altered submergence patterns, and a temporary stress response (NSF and USGS 2011; Samuel et al. 2005). These brief responses would be expected to dissipate once the aircraft has left the area.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Noise: G&G	Infrequent site characterization surveys and scientific surveys produce high-intensity impulsive noise around sites of investigation. These activities have the potential to result in some impacts, including potential auditory injuries, short-term disturbance, behavioral responses, and short-term displacement of feeding or migrating sea turtles, if present	Same as ongoing activities, with the addition of possible future oil and gas exploration surveys.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	within the ensonified area (NSF and USGS 2011). The potential for PTS and TTS is considered possible in proximity to G&G surveys using air guns, but impacts are unlikely as turtles would be expected to avoid such exposure and survey vessels would pass quickly (NSF and USGS 2011). No significant impacts would be expected at the population level.			
Noise: HRG	Possibly included in site characterization surveys and scientific surveys are high-resolution geophysical (HRG) surveys. HRG surveys could be conducted using one or two airguns as the acoustic source, but they generally use electromechanical sources such as side-scan sonars, shallow- and medium-penetration sub-bottom profilers, and single- or multibeam echosounders. Non-airgun HRG sources are often used in combination in order to acquire necessary data during a single deployment. HRG surveys are sometimes conducted using autonomous underwater vehicles equipped with multiple acoustic sources (NMFS 2018b). HRG surveys are typically on a time scale of weeks and higher frequency HRG survey noise resulting from cable route surveys could be less intense than G&G noise from site investigation surveys in WEAs. Impacts include potential auditory injuries, short-term disturbance, behavioral responses, and short-term displacement of feeding or migrating sea turtles, if present within the ensonified area (NSF and USGS 2011). These impacts would be negligible as turtles would be expected to avoid exposure and survey vessels would pass quickly (NSF and USGS 2011). No significant impacts would be expected at the population level.	Same as ongoing activities, with the addition of possible future oil and gas exploration surveys.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Noise: Turbines	Available evidence suggests that typical underwater noise levels from operating WTGs would be below current cumulative injury and behavioral effect thresholds for sea turtles. Operating turbines were determined to produce underwater noise on the order of 110 to 125 $dB_{RMS,}$ occasionally reaching as high as 128 dB_{RMS} in the 10-Hz to 8-kHz range (Tougaard et al. 2020). As measured at the BIWF, low-frequency operational noise barely exceeds ambient levels at 164 feet (50 m) from the WTG base (Miller and Potty 2017). Operational noise impacts would be expected to be negligible.	This sub-IPF does not apply to future non–offshore wind development.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted through water and/or through the seafloor can result in high-intensity, low-exposure levels and long-term but localized intermittent risk to sea turtles. Impacts, potentially including behavioral responses, masking, TTS, and PTS, would be localized in nearshore waters. Data regarding threshold levels for impacts on sea turtles from sound exposure during pile driving are very limited, and no regulatory threshold criteria have been established for sea turtles. Based on current literature, the following thresholds are used to assess impacts to turtles:	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	Potential mortal injury: 210 dB cumulative SPL or greater than 207 dB_{PEAK} SPL (Popper et al. 2014) Potential mortal injury: 204 dB_{SEL}, 232 dB_{PEAK} (PTS), 189 dB_{SEL}, 226 dB_{PEAK} (TTS) (Navy 2017) Behavioral harassment: 175 dB referenced to 1 µPa rms (Navy 2017)			
Noise: Cable laying/trenching	N/A	Cable laying impacts resulting from future non–offshore wind activities would be identical to those described for future offshore wind projects.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Noise: Vessels	The frequency range for vessel noise (10 to 1000 Hz) (MMS 2007) overlaps with sea turtles' known hearing range (less than 1,000 Hz with maximum sensitivity between 200 to 700 Hz (Bartol 1994) and would therefore be audible. However, Hazel et al. (2007) suggest that sea turtles' ability to detect approaching vessels is primarily vision-dependent, not acoustic. Sea turtles could respond to vessel approach and/or noise with a startle response (diving or swimming away) and a temporary stress response (NSF and USGS 2011). Samuel et al. (2005) indicated that vessel noise could have an effect on sea turtle behavior, especially their submergence patterns.	See Section 3.16. Any offshore projects that require the use of ocean vessels could result in long-term but infrequent impacts on sea turtles, including temporary startle responses, masking of biologically relevant sounds, physiological stress, and behavioral changes, especially their submergence patterns (NSF and USGS 2011; Samuel et al. 2005). However, BOEM expects that these brief responses of individuals to passing vessels would be unlikely given the patchy distribution of sea turtles, and no stock or population-level effects would be expected.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Port expansion activities are localized to nearshore habitats and are expected to result in short-term, temporary impacts, if any, on sea turtles. Vessel noise could affect sea turtles, but response would be expected to be short- term and temporary (see the Vessels: Noise sub-IPF above). The impact on water quality from sediment suspension during port expansion activities is short term, temporary, and would be similar to those described under the New cable emplacement/maintenance IPF above.	Between 1992 and 2012, global shipping traffic increased fourfold (Tournadre 2014). The U.S. OCS is no exception to this trend, and growth is expected to continue as human population increases. In addition, the general trend along the coastal region from Virginia to Maine is that port activity would increase modestly. The ability of ports to receive the increase in larger ships would require port modifications. Future channel-deepening activities are being undertaken to accommodate deeper draft vessels for the Panama Canal locks. The additional traffic and larger vessels could have impacts on water quality through increases in suspended sediments and the potential for accidental discharges. The increased sediment suspension could be long term depending on the vessel traffic increase. Certain types of vessel traffic have increased recently (e.g., ferry use and cruise industry) and could continue to increase in the foreseeable future. Additional impacts associated with the increased risk of vessel strikes could also occur (see the Traffic: Vessel collisions sub-IPF below).	The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Port improvements could lead to an increase in vessel traffic during construction (see Section 3.16), O&M, and decommissioning. The resulting change in vessel traffic in the geographic analysis area cannot be predicted because, while some ports have been identified as possibilities for expansion, no specific project plans have been proposed. Therefore, impacts would be **negligible** adverse. Any future port expansion and associated increase in vessel traffic would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential effects on sea turtles regionwide.	**Offshore:** Several regional ports could be used during Project construction, including ports in Baltimore, MD; New Bedford, MA; New London, CT; Norfolk, VA; Paulsboro, NJ; and Providence, RI, as well as Europe. The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects, but no specific improvements are included in Alternatives B through F. Therefore, impacts would be **negligible** adverse. Any future port expansion would be subject to independent NEPA analysis and regulatory approvals requiring full consideration of potential environmental effects. Future actions, should they occur, could involve activities like dredging and the expansion or development of new structures that could lead to adverse effects on coastal and estuarine habitats used by sea turtles and their prey species. These projects could result in cumulative effects on sea turtles, but the extent and significance of these effects cannot be evaluated because no project proposals have been developed. Therefore, impacts would be **negligible** adverse. However, the environmental effects resulting from any future port expansions would be evaluated in independent NEPA analysis, ESA compliance documents, and other regulatory approvals for each project. **Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.

Associated IPF: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
Presence of structures: Entanglement or ingestion of lost fishing gear	The Mid-Atlantic region has more than 130 artificial reefs. Currently, bridge foundations and the BIWF could be considered artificial reefs and could have higher levels of recreational fishing, which increases the chances of sea turtles encountering lost fishing gear, resulting in possible ingestions, entanglement, injury, or death of individuals (Berreiros and Raykov 2014; Gregory 2009; Vegter et al. 2014) if present where these structures are located. At the scale of the geographic analysis area for sea turtles, there are very few areas that would serve to concentrate recreational fishing and increase the likelihood that sea turtles would encounter lost fishing gear.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Presence of structures: Habitat conversion and prey aggregation	The Mid-Atlantic region has more than 130 artificial reefs. Hard-bottom (scour control and rock mattresses) and vertical structures (bridge foundations and BIWF WTGs) in a soft-bottom habitat can create artificial reefs, thus inducing the reef effect (NMFS 2015; Taormina et al. 2018). The reef effect is usually considered a beneficial impact, associated with higher densities and biomass of fish and decapod crustaceans (Taormina et al. 2018), providing a potential increase in available forage items and shelter for sea turtles compared to the surrounding soft bottoms.	The presence of structures associated with non–offshore wind development in nearshore coastal waters has the potential to provide habitat for sea turtles as well as preferred prey species. This reef effect has the potential to result in long-term, low-intensity beneficial impacts. Bridge foundations would continue to provide foraging opportunities for sea turtles, with measurable benefits to some individuals.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Presence of structures: Avoidance/Displacement	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF. There could be some impacts resulting from the existing BIWF, but given that there are only five WTGs, no measurable impacts are occurring.	Not contemplated for non–offshore wind facility sources.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Presence of structures: Behavioral disruption (breeding and migration)	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non–offshore wind facility sources.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Presence of structures: Displacement into higher risk areas (vessels and fishing)	No ongoing activities in the geographic analysis area for sea turtles beyond offshore wind facilities are measurably contributing to this sub-IPF.	Not contemplated for non–offshore wind facility sources.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Sediment deposition and burial	Ongoing sediment dredging for navigation purposes results in fine sediment deposition. Ongoing cable maintenance activities also infrequently disturb bottom sediments; these disturbances are local and limited to the emplacement corridor. Data are not available regarding effects of suspended sediments on adult and juvenile sea turtles, although elevated suspended sediments could cause individuals to alter normal movements and behaviors. However, these changes are expected to be too small to be detected (NOAA 2020b). Sea turtles would be expected to swim away from the sediment plume. Elevated turbidity is most likely to affect sea turtles if a plume causes a barrier to normal behaviors, but no impacts would be expected due to swimming through the plume (NOAA 2020b). Turbidity associated with increased	The impact on water quality from sediment suspension during cable emplacement is short term and temporary. If elevated turbidity caused any behavioral responses such as avoidance of the turbidity zone or changes in foraging behavior, such behaviors would be temporary, and any impacts would be short term and temporary. Turbidity associated with increased sedimentation could result in short-term, temporary impacts on some sea turtle prey species.	As previously noted, up to 10,024 miles of cable would be added in the geographic analysis area. Cable placement and other related construction activities would disturb the seafloor, creating plumes of fine sediment that would disperse and resettle in the vicinity. Data are not available regarding impacts of suspended sediments on adult and juvenile sea turtles, although elevated suspended sediments could cause individuals to alter normal movements and behaviors. However, these changes would be limited in extent, short term in duration, and likely too small to be detected (NOAA 2020b). Seafloor disturbance during construction of future offshore wind projects could affect foraging success for some prey species; however, given that impacts would be short term and generally localized to the cable corridor, no population-level effects on sea turtles would be expected. Overall, anticipated effects from	**Offshore:** Construction of the RWF and offshore RWEC is expected to result in elevated levels of suspended sediment in the immediate proximity of bed-disturbing activities like pile driving, placement of scour protection, and trenching and burial of the RWEC and IAC. The majority of water column effects would be limited to short-term TSS pulses below 100 mg/L. Higher TSS concentrations exceeding 100 mg/L would occur in areas where seafloor sediments have a greater proportion of mud and silt. TSS plumes caused by construction disturbance would dissipate quickly, with concentrations above 100 mg/L lasting no longer than 6 hours at any location (RPS 2021). A summary of the anticipated extent of water column TSS and substrate burial effects is provided in Section 3.6. These effects would be short term because TSS levels are predicted to return to

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	sedimentation could result in short-term, temporary impacts on sea turtle prey species.		sediment deposition and burial on sea turtles would be **negligible** adverse.	normal within minutes to hours of activity completion, depending on the magnitude of disturbance and sediments disturbed. Direct physical effects from TSS exposure are unlikely because sea turtles breathe air and do not share the physiological sensitivities of susceptible organisms like fish and invertebrates. Turtles could alter their behavior in response to elevated suspended sediment levels (e.g., moving away from an affected area). They could also experience behavioral stressors (e.g., reduced ability to forage and avoid predators). However, turtles are highly mobile and can avoid short-term suspended sediment impacts that are limited in severity and range. Given the anticipated extent of potential suspended sediment impacts expected to result from the Project, sea turtle mobility to avoid exposure, and low sea turtle sensitivity to this stressor, effects to sea turtles from elevated suspended sediment levels would be **negligible** adverse. Alternatives C through F would result in similar impacts to sediment deposition and burial to the Proposed Action but reduced in extent and therefore **negligible**. Many sea turtle species routinely inhabit nearshore and estuarine environments with periodically high natural turbidity levels; therefore, short-term exposure to elevated suspended sediment is unlikely to measurably inhibit foraging (Michel et al. 2013). As discussed in Section 3.6, habitat disturbance and resettled sediment are natural ecosystem processes, and impacts on prey and foraging success for sea turtles would also be **negligible** adverse for Alternatives B through F. Seafloor disturbance during O&M activities would be limited. As noted previously, the cables are unlikely to require repair or maintenance, but up to 10% of cable protection could need to be replaced over the life of the Project. Replacement of the cable protection could result in localized, temporary increases in TSS. However, consistent with impacts of cable installation, suspended sediment plumes would be limited to within 10 to 12 feet of the seafloor in the open ocean waters where marine mammals are most likely to occur. Potential effects of removal of the cable during decommissioning would be similar in nature to those anticipated for cable installation or replacement of cable protection. Those species that are exposed to elevated TSS would be unlikely to experience measurable effects on behavior, foraging success, or mobility. Sediment deposition and burial effects on sea turtles resulting from Alternatives B through F Project O&M and decommissioning would be temporary **negligible** adverse. BOEM estimates a cumulative total of up to 30,885 acres of seafloor disturbance for the Proposed Action plus all other future offshore wind projects in the geographic analysis area. Alternatives C through F would result in impacts similar to the Proposed Action, but the magnitude of those impacts would be reduced based on the smaller footprint proposed for these alternatives. As discussed above, TSS effects on sea

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				turtles are likely to be negligible adverse because of limited potential exposure to elevated TSS. No population-level effects on sea turtles are expected from reduced water quality. Therefore, Alternatives B through F when combined with past, present, and reasonably foreseeable activities would result in **negligible** adverse cumulative effects on sea turtles.
Traffic: Vessel collisions	Current activities contributing to this sub-IPF include port traffic levels, fairways, traffic separation schemes, commercial vessel traffic, recreational and fishing activity, and scientific and academic vessel traffic. Propeller and collision injuries from boats and ships are common in sea turtles. Vessel strike is an increasing concern for sea turtles, especially in the southeastern United States, where development along the coasts is likely to result in increased recreational boat traffic. In the United States, the percentage of strandings of loggerhead sea turtles that were attributed to vessel strikes increased from approximately 10% in the 1980s to a record high of 20.5% in 2004 (NMFS and USFWS 2007). Sea turtles are most susceptible to vessel collisions in coastal waters, where they forage from May through November. Vessel speed could exceed 10 knots in such waters, and evidence suggests that they cannot reliably avoid being struck by vessels exceeding 2 knots (Hazel et al. 2007).	Vessel traffic associated with non–offshore wind development has the potential to result in an increased collision risk. While these impacts would be high consequence, the patchy distribution of sea turtles makes stock or population-level effects unlikely (Navy 2018).	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Warming and sea level rise, storm severity/frequency	Increased storm frequency could lead to long-term, high-consequence impacts on sea turtle onshore beach nesting habitat, including changes to nesting periods, changes in sex ratios of nestlings, and drowned nests as well as loss or degradation of nesting beaches. Offshore impacts, including sedimentation of nearshore hard-bottom habitats, have the potential to result in long-term, high-consequence changes to foraging habitat availability for green turtles.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Ocean acidification	This sub-IPF has the potential to lead to long-term, high-consequence impacts on marine ecosystems by contributing to reduced growth or the decline of invertebrates that have calcareous shells.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Warming and sea level rise, altered habitat/ecology	This sub-IPF has the potential to lead to long-term, high-consequence impacts on sea turtles by influencing distributions of sea turtles and/or prey resources. This sub-IPF has the potential to lead to long-term, high-consequence impacts on sea turtle breeding, foraging, and sheltering habitat use.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Warming and sea level rise, altered migration patterns	This sub-IPF has the potential to lead to long-term, high-consequence impacts on sea turtle habitat use and migratory patterns.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Warming and sea level rise, disease frequency	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters, influencing the frequencies of various diseases of sea turtles such as fibropapillomatosis.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Climate change: Warming and sea level rise, protective measures (barriers, sea walls)	The proliferation of coastline protections have the potential to result in long-term, high-consequence impacts on sea turtle nesting by eliminating or precluding access to potentially suitable nesting habitat or access to potentially suitable habitat.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.
Climate change: Warming and sea level rise; storm severity, frequency, sediment erosion, deposition	Sediment erosion and/or deposition in coastal waters has the potential to result in long-term, high-consequence impacts on green sea turtle foraging habitat. Additionally, sediment erosion has the potential to result in the degradation or loss of potentially suitable nesting habitat.	No future activities were identified within the geographic analysis area for sea turtles other than ongoing activities.	See Section 3.19.1.1 for analysis.	See Sections 3.19.2.2 and 3.19.2.3 for analysis.

Demographics, Employment, and Economics

Table E2-7. Summary of Activities and the Associated Impact-Producing Factors for Demographics, Employment, and Economics

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Energy generation/ security	In 2017, Massachusetts energy production totaled 125.2 trillion British thermal units (Btu), of which 72.4 trillion Btu was from renewable sources, including geothermal, hydroelectric, wind, solar, and biomass (U.S. Energy Information Administration 2018). In 2019, Rhode Island energy production totaled 8.8 trillion Btu from renewable resources, including biofuels, wood and waste, and noncombustible renewables. In the same year, Connecticut energy production totaled 211.9 trillion Btu, of which 37.2 trillion Btu was from renewable sources (U.S. Energy Information Administration 2021).	Ongoing development of onshore solar and wind energy would provide diversified, small-scale energy generation. State and regional energy markets would require additional peaker plants and energy storage to meet the electricity needs when utility scale renewables are not producing.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Light: Structures	Offshore buoys and towers emit low-intensity light, while onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Light: Vessels	Ocean vessels have an array of lights, including navigational lights and deck lights.	Anticipated modest growth in vessel traffic would result in some growth in the nighttime traffic of vessels with lighting.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
New cable emplacement/ maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be local and limited to emplacement corridors. In the geographic analysis area for demographics, employment, and economics there are six existing power cables.	The FCC has two pending submarine telecommunication cable applications in the North Atlantic. Future new cables would disturb the seafloor and cause temporary increases in suspended sediment, resulting in infrequent, localized, short-term impacts over the next 35 years.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also going through continual upgrades and maintenance. The New Bedford Marine Commerce Terminal was upgraded	Ports would need to perform maintenance and upgrade facilities over the next 35 years to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	by the port specifically to support the construction of offshore wind energy facilities.			
Port utilization: Maintenance/ Dredging	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. As ports expand, maintenance dredging of shipping channels is expected to increase.	Ports would need to perform maintenance and upgrades over the next 35 years to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. The likelihood of allisions is expected to continue at or near current levels.	Vessel allisions with non–offshore wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. Such loss and damage are direct costs for gear owners and are expected to continue at or near current levels.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these locations, which could be known as fish aggregating devices (FADs). Recreational and commercial fishing can occur near the FADs, although recreational fishing is more popular, because commercial mobile fishing gear is more likely to snag on FADs.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Habitat conversion	Structures, including foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented species thus benefit on a constant basis.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure because vessels need to avoid both the structure and each other.	Vessel traffic, overall, is not expected to meaningfully increase over the next 35 years. The presence of navigation hazards is expected to continue at or near current levels.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Space use conflicts	Current structures do not result in space use conflicts.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Presence of structures: Viewshed	No existing offshore structures are within the viewshed of the WEA except buoys.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Traffic: Vessels	Ports and marine traffic related to shipping, fishing, and recreation are important to the region's economy. No substantial changes are anticipated to existing vessel traffic volumes.	New vessel traffic near the geographic analysis area would be generated by proposed barge routes and dredging demolition sites over the next 35 years. Marine commerce and related industries would continue to be important to the economy.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Traffic: Vessel collisions	The region's substantial marine traffic could result in occasional vessel collisions, which would result in costs to the vessels involved. The likelihood of collisions is expected to continue at or near current rates.	No substantial changes are anticipated.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Traffic: Vehicle	Onshore development activities support local population growth, employment, and economies. Disturbances can cause temporary, localized traffic delays and restricted access to adjacent properties.	Onshore development projects would be ongoing in accordance with local government land use plans and regulations.	See Section 3.11.1.1 for analysis.	See Sections 3.11.2.2 and 3.11.2.3 for analysis of impacts.
Climate change	Climate models predict climate change if current trends continue. Climate change has adverse implications for demographics and the economic health of coastal communities, due in part to the costs of resultant damage to property and infrastructure, fisheries and other natural resources, increased disease frequency, and sedimentation, among other factors.	Onshore projects that reduce air emissions could contribute to the effort to limit climate change. Onshore solar and wind energy projects, although producing less energy than potential offshore wind developments, would also provide incremental reductions.	Because future offshore wind energy facilities would produce less GHG emissions than fossil fuel–combusting power generation facilities with similar capacities, these facilities would reduce the adverse effects of climate change on the demographic and economic health of coastal communities in the geographic analysis area. These beneficial impacts would be long term, but they would be **negligible** adverse given the magnitude of global GHG emissions and their adverse demographic, employment, and economic impacts.	During operations, the Proposed Action would have a beneficial impact to demographic, employment, or economic conditions in the geographic analysis area by contributing to a broader combination of actions to reduce future impacts from climate change over the long term. These beneficial impacts would be long term, but they would be **negligible** adverse given the magnitude of global GHG emissions and their adverse demographic, employment, and economic impacts for all design configurations analyzed under the Proposed Action. Collectively, the Proposed Action when combined with past, present, and reasonably foreseeable projects would have long-term **major** adverse impacts on demographic, employment, and economic conditions in the geographic analysis area, primarily through the associated risks of flooding, extreme heat, and storm damage. Alternatives C through F would be similar to that for the Proposed Action: long term beneficial **negligible** during operations and cumulatively long term **major** adverse for all design configurations analyzed.

Environmental Justice

No IPFs with solely negligible impacts were identified.

Table E2-8. Summary of Activities and the Associated Impact-Producing Factors for Environmental Justice

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	Accidental releases of fuels and fluids occur during vessel usage for dredge material ocean disposal; fisheries use; marine transportation; military use; survey activities; and cable, line, and pipeline laying. According to the Department of Energy, 31,000 barrels of petroleum are spilled into U.S. waters from vessels and pipelines in a typical year. Approximately 40.5 million barrels of oil were lost as a result of tanker incidents from 1970 to 2009, according to International Tanker Owners Pollution	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue a similar trend to ongoing uses. Impacts are unlikely to affect water quality.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	Federation Limited (2021), which collects data on oil spills from tankers and other sources. From 1990 to 1999, the average annual input to the coastal Northeast was 220,000 barrels of petroleum and into the offshore was < 70,000 barrels. Impacts on water quality would be expected to brief and localized from accidental releases.			
Discharges	Discharges impact water quality by introducing nutrients, chemicals, and sediments to the water. There are regulatory requirements related to prevention and control of discharges, the prevention and control of accidental spills, and the prevention and control of nonindigenous species.	Increased coastal development is causing increased nutrient pollution in communities. In addition, ocean disposal activity in the North and Mid-Atlantic is expected to gradually decrease or remain stable. Impacts of ocean disposal on water quality are minimized because the EPA has established dredge spoil criteria and regulates the disposal permits issued by the USACE. The impact on water quality from sediment suspension during these future activities would be short term and localized.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Air emissions: Construction/ Decommissioning	Ongoing population growth and new development within the geographic analysis area is likely to increase traffic, with a resulting increase in emissions from motor vehicles. Some new industrial development could result in emissions-producing uses. At the same time, many industrial waterfront areas near environmental justice communities are losing industrial uses and converting to more commercial or residential uses.	New development could include emissions-producing industry and new development that would increase emissions from motor vehicles. Some historically industrial waterfront locations would continue to lose industrial uses, with no new industrial development to replace it. Cities such as New Bedford are promoting start-up space and commercial uses to reuse industrial space.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Air emissions: O&M	Ongoing population growth and new development within the geographic analysis area is likely to increase traffic, with a resulting increase in emissions from motor vehicles. Some new industrial development could result in emissions-producing uses. At the same time, many industrial waterfront areas near environmental justice communities are losing industrial uses and converting to more commercial or residential uses.	New development could include emissions-producing industry and new development that would increase emissions from motor vehicles. Some historically industrial waterfront locations would continue to lose industrial uses, with no new industrial development to replace it. Cities such as New Bedford are promoting start-up space and commercial uses to reuse industrial space.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Light: Structures	Offshore buoys and towers emit low-intensity light, while onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
New cable emplacement/maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be local and limited to emplacement corridors.	The FCC has two pending submarine telecommunication cable applications in the North Atlantic. Future new cables would disturb the seafloor and cause temporary increases in suspended sediment, resulting in infrequent, localized, and short-term impacts over the next 35 years.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Noise: O&M	Offshore O&M of existing wind energy projects generates negligible amounts of noise.	There are no reasonably foreseeable offshore facilities that would generate noise from O&M.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. These disturbances are temporary,	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	local, and extend only a short distance beyond the work area.			
Noise: Trenching	Infrequent trenching for pipeline and cable laying activities emits noise. These disturbances are temporary, local, and extend only a short distance beyond the emplacement corridor. Impacts of trenching noise are typically less prominent than the impacts of the physical disturbance and sediment suspension.	Periodic trenching would be needed over the next 35 years for repair or new installation of underground infrastructure.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Noise: Vessels	Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this sub-IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Presence of structures: Entanglement, gear loss/damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. Such loss and damage are direct costs for gear owners and are expected to continue at or near current levels.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure because vessels need to avoid both the structure and each other.	Vessel traffic is generally not expected to meaningfully increase over the next 35 years. The presence of navigation hazards is expected to continue at or near current levels.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Presence of structures: Onshore construction	Onshore development supports local population growth, employment, and economics.	Onshore development would continue in accordance with local government land use plans and regulations.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Presence of structures: Space use conflicts	Current structures do not result in space use conflicts.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Presence of structures: Viewshed	There are no existing offshore structures within the viewshed of the WEA except buoys.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Traffic: Vessels	Ports and marine traffic related to shipping, fishing, and recreation are important to the region's economy. No substantial changes are anticipated to existing vessel traffic volumes.	New vessel traffic near the geographic analysis area would be generated by proposed barge routes and dredging demolition sites over the next 35 years. Marine commerce and related industries would continue to be important to employment.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.
Climate change	Climate models predict climate change if current trends continue. Climate change has adverse implications for demographics and the economic health of coastal communities, due in part to the costs of resultant damage to property and infrastructure, fisheries, and other natural resources; increased disease frequency; and sedimentation, among other factors. Factors that make environmental justice populations particularly vulnerable to the adverse health, safety, and economic impacts of climate change-–related events such as heat waves, heavy	Onshore projects that reduce air emissions could contribute to the effort to limit climate change. Onshore solar and wind energy projects, although producing less energy than potential offshore wind developments, would also provide incremental reductions.	See Section 3.12.1.1 for analysis.	See Sections 3.12.2.2 and 3.12.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	flooding, and droughts include where they live, language barriers, their health, and their limited financial resources to cope with these effects (Cho 2020; EPA 2017). The frequency and intensity of climate-related events such as heat waves and heavy flooding are becoming more frequent and more intense across most land regions, and this trend is expected to continue (IPCC 2021).			

Cultural Resources

No IPFs with solely negligible impacts were identified.

Table E2-9. Summary of Activities and the Associated Impact-Producing Factors for Cultural Resources

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for water quality for a quantitative analysis of these risks. Accidental releases of fuel/fluids/hazmat occur during vessel use for recreational, fisheries, marine transportation, or military purposes and other ongoing activities. Both released fluids and cleanup activities that require the removal of contaminated soils and/or seafloor sediments can cause impacts on cultural resources because resources are impacted by the released chemicals as well as the ensuing cleanup activities.	Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases within the geographic analysis area for cultural resources, increasing the frequency of small releases. Although the majority of anticipated accidental releases would be small, resulting in small-scale impacts on cultural resources, a single, large-scale accidental release such as an oil spill, could have significant impacts on marine and coastal cultural resources. A large-scale release would require extensive cleanup activities to remove contaminated materials resulting in damage to or the complete removal of terrestrial and marine cultural resources. In addition, the accidentally released materials in deep water settings could settle on seafloor cultural resources such as wreck sites, accelerating their decomposition and/or covering them and making them inaccessible/unrecognizable to researchers, resulting in a significant loss of historic information. As a result, although considered unlikely, a large-scale accidental release and associated cleanup could result in permanent, geographically extensive, and large-scale impacts on cultural resources.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Accidental releases: Trash and debris	Accidental releases of trash and debris occur during vessel use for recreational, fisheries, marine transportation, or military purposes and other ongoing activities. While the released trash and debris can directly affect cultural resources, the majority of impacts associated with accidental releases occur during cleanup activities, especially if soil or sediment removed during cleanup affect known and undiscovered cultural resources. In addition, the presence of large amounts of trash on shorelines or the ocean surface can impact the cultural value of TCPs for stakeholders. State and federal laws	Future activities with the potential to result in accidental releases consist of construction and operations of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications). Accidental releases would continue at current rates along the Northeast Atlantic coast.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	prohibiting large releases of trash would limit the size of any individual release and ongoing local, state, and federal efforts to clean up trash on beaches and waterways would continue to mitigate the effects of small-scale accidental releases of trash.			
Anchoring	The use of vessel anchoring and gear (i.e., wire ropes, cables, chains on the seafloor) that disturbs the seafloor, such as bottom trawls and anchors, by military, recreational, industrial, and commercial vessels can impact cultural resources by physically damaging marine cultural resources such as shipwrecks and debris fields.	Future activities with the potential to result in anchoring/gear utilization consist of construction and operations of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); military use; marine transportation; fisheries use and management; and oil and gas activities. These activities are likely to continue to occur at current rates along the entire coast of the eastern United States.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2. 7 for analysis of impacts.
Light: Vessels	Light associated with military, commercial, or construction vessel traffic can temporarily affect coastal historic structures and TCP resources when the addition of intrusive, modern lighting changes the physical environment (setting) of cultural resources. The impacts of construction and operations lighting would be limited to cultural resources on the shoreline for which a nighttime sky is a contributing element to historic integrity. This excludes resources that are closed at night, such as historic buildings, lighthouses, and battlefields, and resources that generate their own nighttime light, such as historic districts. Offshore construction activities that require increased vessel traffic, construction vessels stationed offshore, and construction area lighting for prolonged periods can cause more sustained and significant visual impacts on coastal historic structure and TCP resources.	Future activities with the potential to result in vessel lighting impacts consist of construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Light: Structures	The construction of new structures that introduce new light sources into the setting of historic architectural properties or TCPs can result in impacts, particularly if the historic and/or cultural significance of the resource is associated with uninterrupted nighttime skies or periods of darkness. Any tall structure (commercial building, radio antenna, large satellite dishes, etc.) requiring nighttime hazard lighting to prevent aircraft collision can cause these types of impacts.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Presence of structures	The only existing offshore structures within the viewshed of the geographic analysis area are minor features such as buoys.	Non-offshore wind structures that could be viewed would be limited to met towers. Marine activity would also occur within the marine viewshed of the geographic analysis area.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Presence of structures: Onshore construction	Onshore construction activities can impact terrestrial cultural resources by damaging and/or removing resources.	Future activities that could result in terrestrial land disturbance impacts consist of onshore residential, commercial, industrial, and military development activities in and near Quonset Point, Rhode Island. Onshore construction would continue at current rates.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
New cable emplacement/ maintenance	Current offshore construction activity is limited to submarine fiber-optic and electrical transmission cables, including six existing power cables in the geographic analysis area.	Future activities with the potential to result in seafloor disturbances similar to offshore impacts consist of construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); tidal energy projects; marine minerals use and ocean-dredged material disposal; military use; and oil and gas activities. Such activities could cause impacts on submerged marine cultural resources, including shipwrecks and formerly subaerially exposed pre-contact Native American cultural sites.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, storm severity/frequency	Sea level rise and increased storm severity and frequency would result in impacts on archaeological, architectural, and TCP resources. Increased storm frequency and severity would also result in damage to and/or destruction of architectural properties. Sea level rise would increase erosion-related impacts on archaeological and architectural resources, while sea level rise would inundate archaeological, architectural, and TCP resources.	Sea level rise and storm severity/frequency would increase due to the effects of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, altered habitat/ecology	Altered habitat/ecology related to warming seas and sea level rise would impact the ability of Native Americans and other communities to use maritime TCPs for traditional fishing, shell fishing, and fowling activities.	The rate of change to habitats/ecology would increase as a result of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, altered migration patterns	Altered migration patterns related to warming seas and sea level rise would impact the ability of Native Americans and other communities to use maritime TCPs for traditional fishing, shellfishing, and fowling activities.	The rate of change to migratory animal patterns would increase as a result of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, property/ infrastructure damage	Sea level rise and increased storm severity and frequency would result in impacts on archaeological, architectural, and TCP resources. Increased storm frequency and severity would result in damage to and/or destruction of architectural properties. Sea level rise would increase erosion-related impacts on archaeological and architectural resources, while sea level rise would inundate archaeological, architectural, and TCP resources.	The rate of property and infrastructure damage would increase as a result of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, protective measures (barriers, sea walls)	The installation of protective measures such as barriers and sea walls would impact cultural resources during associated ground-disturbing activities. Construction of these modern protective structures would alter the viewsheds from historic properties and/or TCPs, resulting in impacts on the historic and/or cultural significance of resources.	The installation of coastal protective measures would increase as a result of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.
Climate change: Warming and sea level rise, storm severity/frequency, sediment erosion, deposition	Sea level rise and increased storm severity and frequency would result in impacts on archaeological, architectural, and TCP resources. Increased storm frequency and severity would result in damage to and/or destruction of architectural properties. Sea level rise would increase erosion-related impacts on archaeological and	Sea level rise and storm severity/frequency would increase due to the effects of climate change.	See Section 3.10.1 for analysis.	See Sections 3.10.2.2 through 3.10.2.7 for analysis of impacts.

Associated IPF: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	architectural resources, while sea level rise would inundate archaeological, architectural, and TCP resources.			

Recreation and Tourism

Table E2-10. Summary of Activities and the Associated Impact-Producing Factors for Recreation and Tourism

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Anchoring	Anchoring occurs due to ongoing military, survey, commercial, and recreational activities.	Impacts from anchoring would continue and could increase due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Modest growth in vessel traffic could increase the temporary, localized impacts of navigational hazards, increased turbidity levels, and potential for direct contact causing mortality of benthic resources.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Light: Vessels	Ocean vessels have an array of lights, including navigational lights and deck lights.	Anticipated modest growth in vessel traffic would result in some growth in the nighttime traffic of vessels with lighting.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Light: Structures	Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
New cable emplacement/ maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be local and limited to emplacement corridors.	Cable maintenance or replacement of existing cables in the geographic analysis area would occur infrequently and would generate short-term disturbances.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Noise: O&M	Limited to BIWF	Not applicable.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when piers, bridges, pilings, and seawalls are installed or upgraded. These disturbances are temporary, local, and extend only a short distance beyond the work area.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Noise: Cable laying/trenching	Offshore trenching occurs periodically in connection with cable installation or sand and gravel mining.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Noise: Vessels	Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this sub-IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also	Ports would need to perform maintenance and upgrade facilities over the next 35 years to ensure that they can	**Offshore:** Existing ports used for staging and construction of planned future projects could influence recreational	**Offshore:** Existing ports in the geographic analysis area that would be used for Project staging and construction

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	experiencing continual upgrades and maintenance. The New Bedford Marine Commerce Terminal was upgraded by the port specifically to support the construction of offshore wind energy facilities.	still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size.	opportunities or access. However, these ports are primarily industrial in character and are not intended to support recreational activity as a primary use. If used secondarily for recreation, any port improvements could result in short-term delays and crowding during construction but would result in increased berths and amenities for recreational vessels, improved navigational channels, or opportunities to separate recreational boating from commercial shipping in the long term. Because impacts to offshore recreation and tourism related to current marine industrial activities at existing ports would not experience significant changes, regardless of offshore wind industry development (BOEM 2016), only **negligible** adverse impacts on recreation and tourism could occur.	consist of the Port of Montauk, Port Jefferson, Port of Providence, Port of Davisville at Quonset Point, Point of Galilee, Port of New London, and New Bedford Marine Commerce Terminal. However, these ports are primarily industrial in character and are not intended to service recreational activity. Therefore, the Proposed Action would have a long-term **negligible** adverse impact on recreation and tourism due to port utilization within the geographic analysis area. Impacts of Alternatives C through F would be similar to the Proposed Action. As previously noted, existing ports used for O&M of the Project could influence recreational opportunities or access. However, these ports are primarily industrial in character and are not intended to support recreational activity as a primary use. Because impacts to offshore recreation and tourism related to current marine industrial activities at existing ports would not experience significant changes, regardless of offshore wind industry development (BOEM 2016), negligible adverse impacts on recreation and tourism could occur. Impacts during decommissioning would be similar to the impacts during construction and installation. Although Alternatives C through F would reduce the number of WTGs and associated IACs, the impact would be negligible adverse. Port activity would result in increased short-term construction traffic and long-term operational traffic to the No Action Alternative, which could coincide with recreational activity in the vicinity, depending on transportation type (e.g., vessels, rail, or road vehicle). However, activities related to the Proposed Action at port facilities would occur within the boundaries of existing ports or other repurposed industrial facilities where recreational users would not be expected to occur. Project activities at ports would be similar to those already taking place at these facilities and would be consistent with state and local agency guidelines regarding land use, access, noise and air quality, and other impacts on nearby neighborhoods. Alternatives C through F would reduce the number of WTGs and associated IACs, but Project impacts on this IPF would be similar to the Proposed Action, Therefore, Alternatives B through F when combined with past, present, and reasonably foreseeable activities would have **negligible** adverse cumulative impacts on recreation and tourism.
			Onshore: Impacts to onshore recreation and tourism related to current marine industrial activities at existing ports would not result in significant changes, regardless of	**Onshore:** The proposed O&M facility (located in the Port of Brooklyn, Port of Davisville at Quonset Point, Port of Galilee, Port Jefferson, or Port of Montauk) would be located within an existing industrial port. No new building

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			offshore wind industry development (BOEM 2016). Therefore, impacts would be **negligible** adverse.	construction would occur at the Port of Galilee or Port of Brooklyn; use of these ports is assumed to be limited to existing facilities maintained by the ports. However, a new building with up to 1,000 square feet of office space and up to 11,000 square feet of equipment storage space could be constructed at the Port of Davisville at Quonset Point or the Port of Montauk. A BOEM study suggests that impacts on recreation and tourism related to current marine industrial activities at existing ports would not experience significant long-term changes, regardless of offshore wind industry development (BOEM 2016). However, the study notes that although the Atlantic coast already possesses the necessary infrastructure to support offshore wind, the industry is still evolving (BOEM 2016), and communication, flexibility, and scalability are needed to ensure port selection would not impact tourism or recreation. Based on BOEM's findings, negligible temporary adverse impacts to recreation or tourism activities from port use are anticipated during construction. O&M facilities and activity would be indistinguishable from other industrial or commercial businesses and maritime activities that typically occur at proposed port locations. As these ports do not provide recreation as a primary service, O&M would have negligible adverse impacts on onshore recreation and tourism. Project facilities and port activity would be indistinguishable from other industrial or commercial businesses and maritime activities that typically occur at proposed port locations. As these ports do not provide recreation as a primary service, Alternatives B through F when combined with past, present, and reasonably foreseeable projects would result in temporary **negligible** adverse cumulative impacts to onshore recreation and tourism.
Port utilization: Maintenance/ Dredging	No major ports are within the geographic analysis area. Periodic maintenance is necessary for harbors within the geographic analysis area.	Ongoing maintenance and dredging of harbors within the geographic analysis area would continue as needed. No specific projects are known.	See Port Utilization: Expansion for analysis of offshore and onshore impacts.	See Port Utilization: Expansion for analysis of offshore and onshore impacts.
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. The likelihood of allisions is expected to continue at or near current levels.	Vessel allisions with non–offshore wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures.	No future activities were identified within the recreation and tourism geographic analysis area other than ongoing activities.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Presence of structures: Fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented fishes are attracted to these locations. Recreational and commercial fishing can occur near these aggregation locations, although recreational fishing is more popular because commercial mobile fishing gear is more likely to snag on structures.			
Presence of structures: Habitat conversion	Structures, including foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly flat seascape. Structure-oriented species thus benefit on a constant basis.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions, especially in nearshore areas. This navigation becomes more complex when multiple vessels must navigate around a structure because vessels need to avoid both the structure and each other.	Vessel traffic, overall, is not expected to meaningfully increase over the next 35 years. The presence of navigation hazards is expected to continue at or near current levels.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Presence of structures: Space use conflicts	Current structures do not result in space use conflicts.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts during offshore activities.
Presence of structures: Viewshed	The only existing offshore structures within the viewshed of the Project are minor features such as buoys.	Non-offshore wind structures that could be viewed in conjunction with the offshore components of the Project would be limited to met towers. Marine activity would also occur within the marine viewshed.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.
Traffic: Vessels	Ports and marine traffic related to shipping, fishing, and recreation are important to the region's economy. No substantial changes are anticipated to existing vessel traffic volumes.	New vessel traffic in the geographic analysis area would be generated by proposed barge routes and dredging demolition sites over the next 35 years. Marine commerce and related industries would continue to be important to the economy.	See Section 3.18.1.1 for analysis.	See Sections 3.18.2.2 and 3.18.2.3 for analysis of impacts.

Visual Resources

No IPFs with solely negligible impacts were identified.

Table E2-11. Summary of Activities and the Associated Impact-Producing Factors for Visual Resources

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Light: Vessels	Light associated with military, commercial, or construction vessel traffic can temporarily affect coastal viewsheds when the addition of intrusive, modern lighting changes the physical environment (setting). Offshore construction activities that require increased vessel traffic, construction vessels stationed offshore, and construction area lighting for prolonged periods can cause more sustained and significant visual impacts.	Future activities with the potential to result in vessel lighting impacts consist of construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity	See Section 3.20.1.1 for analysis.	See Sections 3.20.2.2 and 3.20.2.3 for analysis.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
		along the Northeast coast, with a slight increase due to population increase and development over time.		
Light: Structures	The construction of new structures that introduce new light sources can result in impacts, particularly if the light source affects uninterrupted nighttime skies or periods of darkness. Any tall structure (e.g., commercial building, radio antenna, large satellite dish) requiring nighttime hazard lighting to prevent aircraft collision can cause these types of impacts.	Light from onshore structures is expected to gradually increase in line with human population growth along the coast. This increase is expected to be widespread and permanent near the coast but minimal offshore.	See Section 3.20.1.1 for analysis.	See Sections 3.20.2.2 and 3.20.2.3 for analysis.
Presence of structures	The only existing offshore structures within the viewshed of the geographic analysis area are minor features such as buoys.	Non-offshore wind structures that could be viewed would be limited to met towers. Marine activity would also occur within the viewshed of the geographic analysis area.	See Section 3.20.1.1 for analysis.	See Sections 3.20.2.2 and 3.20.2.3 for analysis.

Commercial Fisheries and For-Hire Recreational Fishing

No IPFs with solely negligible impacts were identified.

Table E2-12. Summary of Activities and the Associated Impact-Producing Factors for Commercial Fisheries and For-Hire Recreational Fishing

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	See Table E1-4 for a quantitative analysis of these risks. Ongoing releases are frequent and chronic. Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	See Table E1-4 for a quantitative analysis of these risks. Gradually increasing vessel traffic over the next 35 years would increase the risk of accidental releases. Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Accidental releases: Trash and debris	Trash and debris could be accidentally discharged through fisheries use, dredged material ocean disposal, marine minerals extraction, marine transportation, navigation and traffic, survey activities and cables, and lines and pipeline laying. Accidental releases of trash and debris are expected to be low probability events.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.1 for analysis of offshore impacts.
Anchoring	Impacts from anchoring occur due to ongoing military, survey, commercial, and recreational activities. The short-term, localized impact to this resource is the presence of a navigational hazard (anchored vessel) to fishing vessels.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Anchoring could pose a temporary (hours to days), localized (within a few hundred meters of the anchored vessel) navigational hazard to fishing vessels.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Light	Impacts include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.1 for analysis of offshore impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis. Light can attract finfish and invertebrates, potentially affecting distributions in a highly localized area. Light may also disrupt natural cycles, e.g., spawning, possibly leading to short-term impacts.	cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time.		
New cable emplacement/ maintenance	New cable emplacement and infrequent cable maintenance activities disturb the seafloor, increase suspended sediment, and cause temporary displacement of fishing vessels. These disturbances would be local and limited to the emplacement corridor.	Future new cables and cable maintenance would occasionally disturb the seafloor and cause temporary displacement in fishing vessels and increases in suspended sediment, resulting in local, short-term impacts. If the cable routes enter the geographic analysis area for this resource, short-term disruption of fishing activities would be expected.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Noise: Construction, trenching, O&M	Noise from construction occurs frequently in coastal habitats in populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. Infrequent offshore trenching could occur in connection with cable installation. These disturbances are temporary, local, and extend only a short distance beyond the emplacement corridor. Low levels of elevated noise from operational WTGs likely have low to no impacts on fish and no impacts at a fishery level. Noise is also created by O&M of marine minerals extraction, which has small local impacts on fish, but likely no impacts at a fishery level.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Noise from dredging and sand and gravel mining could occur. New or expanded marine minerals extraction could increase noise during their O&M over the next 35 years. Impacts from construction, operations, and maintenance would likely be small and local on fish and not seen at a fishery level. Periodic trenching would be needed for repair or new installation of underground infrastructure. These disturbances would be temporary, local, and extend only a short distance beyond the emplacement corridor. Impacts of trenching noise on commercial fish species are typically less prominent than the impacts of the physical disturbance and sediment suspension. Therefore, fishery-level impacts are unlikely.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Noise: G&G	Ongoing site characterization surveys and scientific surveys produce noise around sites of investigation. These activities can disturb fish and invertebrates in the immediate vicinity of the investigation and can cause temporary behavioral changes. The extent depends on equipment used, noise levels, and local acoustic conditions.	Site characterization surveys, scientific surveys, and exploratory oil and gas surveys are anticipated to occur infrequently over the next 35 years. Seismic surveys used in oil and gas exploration create high-intensity impulsive noise to penetrate deep into the seafloor, potentially resulting in injury or mortality to finfish and invertebrates in a small area around each sound source and short-term stress and behavioral changes to individuals over a greater area. Site characterization surveys typically use sub-bottom profiler technologies that generate less intense sound waves more similar to common deep-water echosounders. The intensity and extent of the resulting impacts are difficult to generalize but are likely local and temporary.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Noise: Pile driving	Noise from pile driving occurs periodically in nearshore areas when ports or marinas, piers, bridges, pilings, and seawalls are installed or upgraded. Noise transmitted	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	through water and/or the seafloor can cause injury and/or mortality to finfish and invertebrates in a small area around each pile and can cause short-term stress and behavioral changes to individuals over a greater area, leading to temporary, local impacts on commercial fisheries and for-hire recreational fishing. The extent depends on pile size, hammer energy, and local acoustic conditions.			
Noise: Vessels	Vessel noise is anticipated to continue at levels similar to current levels. While vessel noise could have some impact on behavior, it is likely limited to brief startle and temporary stress responses. Ongoing activities that contribute to this sub-IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels.	Planned new barge route and dredging disposal sites would generate vessel noise when implemented.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance, including dredging. Port utilization is expected to increase over the next 35 years.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Port utilization is expected to increase over the next 35 years, with increased activity during construction. The ability of ports to receive the increase in vessel traffic could require port modifications, such as channel deepening, leading to local impacts on fish populations. Port expansions could also increase vessel traffic and competition for dockside services, which could affect fishing vessels.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Presence of structures: Navigation hazard and allisions	Structures within and near the cumulative lease areas that pose potential navigation hazards consist of offshore wind turbines, buoys, and shoreline developments such as docks and ports. An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. Two types of allisions occur: drift and powered. A drift allision generally occurs when a vessel is powered down due to operator choice or power failure. A powered allision generally occurs when an operator fails to adequately control their vessel movements or is distracted.	No known reasonably foreseeable structures are proposed to be located in the geographic analysis area that could affect commercial fisheries. Vessel allisions with non–offshore wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Presence of structures: Entanglement, gear loss, gear damage	Commercial and recreational fishing gear is periodically lost due to entanglement with existing buoys, pilings, hard protection, and other structures. The lost gear, moved by currents, can disturb habitats and potentially harm individuals, creating small, localized, short-term impacts on fish, but likely no impacts at a fishery level.	No future activities were identified within the analysis area other than ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Presence of structures: Habitat conversion and fish aggregation	Structures, including tower foundations, scour protection around foundations, and various means of hard protection atop cables, create uncommon relief in a mostly sandy seascape. A large portion is homogeneous sandy seascape, but there is some other hard and/or complex habitat. Structures are periodically added, resulting in the conversion of existing soft-bottom and hard-bottom habitats to the new hard-structure habitat. Structure-oriented fishes are attracted to these locations. These impacts are local and can be short term to permanent. Fish aggregation could be considered adverse, beneficial, or neither. Commercial and for-hire recreational fishing can occur near these structures. For-hire recreational fishing is more popular because commercial mobile fishing gear is more likely to snag on structures.	New cables, installed incrementally in the geographic analysis area over the next 20 to 35 years, would likely require hard protection atop portions of the route (see the New cable emplacement/maintenance IPF above). Any new towers, buoys, or piers would also create uncommon relief in a mostly flat seascape. Structure-oriented species could be attracted to these locations. Structure-oriented species would benefit (Claisse et al. 2014; Smith et al. 2016). This could lead to more and larger structure-oriented fish communities and larger predators opportunistically feeding on the communities as well as increased private and for-hire recreational fishing opportunities. Soft bottom is the dominant habitat type in the region, and species that rely on this habitat would not likely experience population-level impacts (Greene et al. 2010; Guida et al. 2017). These impacts are expected to be local and could be long term.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Presence of structures: Migration disturbances	Human structures in the marine environment (e.g., shipwrecks, artificial reefs, buoys, and oil platforms) can attract finfish and invertebrates that approach the structures during their migrations. This could slow species migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement than structure (Secor et al. 2018). There is no evidence to suggest that structures pose a barrier to migratory animals.	The infrequent installation of future new structures in the marine environment over the next 35 years could attract finfish and invertebrates that approach the structures during their migrations. This could tend to slow migrations. However, temperature is expected to be a bigger driver of habitat occupation and species movement (Secor et al. 2018). Migratory animals would likely be able to proceed from structures unimpeded. Therefore, fishery-level impacts are not anticipated.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Presence of structures: Space use conflicts	Current structures do not result in space use conflicts.	No known reasonably foreseeable structures are proposed for location in the geographic analysis area that could affect commercial fisheries and for-hire recreational fishing.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Presence of structures: Cable infrastructure	The existing offshore cable infrastructure supports the economy by transmitting electric power and communications between the mainland and islands. Seven submarine cable corridors cross cumulative lease areas. Shoreline developments are ongoing and consist of docks; ports; and other commercial, industrial, and residential structures.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Traffic: Vessels and vessel collisions	No substantial changes are anticipated to the vessel traffic volumes. The geographic analysis area would continue to have numerous ports, and the extensive marine traffic related to shipping, fishing, and recreation would continue to be important to the region's economy. The region's substantial marine traffic could result in occasional collisions. Vessels need to navigate around structures to avoid allisions. When multiple vessels need to navigate around a structure, then navigation is more complex as	New vessel traffic in the geographic analysis area would consistently be generated by proposed barge routes and dredging demolition sites. Marine commerce and related industries would continue to be important to the regional economy.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	the vessels need to avoid both the structure and each other. The risk for collisions is ongoing but infrequent.			
Climate change	Impacts to commercial fisheries and for-hire recreational fishing are expected to result from climate change events such as increased magnitude or frequency of storms, shoreline changes, ocean acidification, and water temperature changes. Risks to fisheries associated with these events include habitat/distribution shifts, disease incidence, and risk of invasive species. If these risk factors result in a decrease in catch and/or an increase in fishing costs (e.g., transiting time), the profitability of businesses engaged in commercial fisheries and for-hire recreational fishing would be adversely affected. While climate change is predicted to have adverse impacts on the distribution and/or productivity of some stocks targeted by commercial fisheries and for-hire recreational fishing, other stocks could be beneficially affected. The economies of communities reliant on marine species that are vulnerable to the effects of climate change could be adversely affected. If the distribution of important stocks changes, it could affect where commercial and for-hire recreational fisheries are located. Furthermore, coastal communities with fishing businesses that have infrastructure near the shore could be adversely affected by sea level rise.	No future activities were identified within the geographic analysis area for this resource other than ongoing activities.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.
Regulated fishing effort	Commercial and recreational regulations for finfish and shellfish implemented and enforced by NOAA Fisheries and coastal states affect how the commercial and for-hire recreational fisheries operate. Commercial and recreational for-hire fisheries are managed by FMPs, which are established to manage fisheries to avoid overfishing through catch quotas, special management areas, and closed area regulations. These can reduce or increase the size of available landings to commercial and for-hire recreational fisheries. For example, ongoing fishing restrictions designed to rebuild depleted stocks in the Northeast Multispecies (large-mesh) fishery would continue to reduce landings in that fishery.	Reasonably foreseeable fishery management actions include measures to reduce the risk of interactions between fishing gear and the NARW by 60% (McCreary and Brooks 2019). This would likely have a **major** adverse impact on fishing effort in the lobster and Jonah crab fisheries in the geographic analysis area for this resource. As discussed in Karp et al. (2019), changing climate and ocean conditions and the resultant effects on species distributions and productivity can have significant effects on management decisions, such as allocation, spatiotemporal closures, stock status determinations, and catch limits.	See Section 3.9.1.1 for analysis of offshore impacts.	See Sections 3.9.2.2 and 3.9.2.3 for analysis of offshore impacts.

Land Use and Coastal Infrastructure

Table E2-13. Summary of Activities and the Associated Impact-Producing Factors for Land Use and Coastal Infrastructure

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases: Fuel/fluids/hazmat	Various ongoing onshore and coastal construction projects include the use of vehicles and equipment that contain fuel, fluids, and hazardous materials that could be released.	Ongoing onshore construction projects involving vehicles and equipment that use fuel, fluids, or hazardous materials could result in an accidental release. Intensity and extent would vary, depending on the size, location, and materials involved in the release.	See Section 3.14.1.1 for analysis.	See Sections 3.14.2.2 and 3.14.2.3 for analysis of impacts.
EMFs	EMFs continuously emanate from existing telecommunication and electrical power transmission cables. New cables generating EMFs are infrequently installed in the geographic analysis area. The extent of impacts is likely less than 50 feet (15.2 m) from the cable, and the intensity of impacts on coastal habitats is likely undetectable.	No future activities were identified within the geographic analysis area for land use and coastal infrastructures other than ongoing activities.	The onshore transmission lines used to connect power generated by future offshore wind projects to the electrical grid would generate detectable EMF effects within a short distance of cable corridors. Most, if not all, future onshore transmission cables would run belowground in buried cable ducts, reducing EMF exposure relative to aboveground electrical infrastructure. Based on modeled EMF levels for currently planned projects (Exponent 2018, 2020), typical EMF levels at approximately 3 feet (1 meter) immediately above the buried cable would range from 73 to 300 mG. Field strength would diminish rapidly with distance, decreasing to near 0 mG within 25 to 50 feet of the cable centerline. These potential effects must be placed in context with typical levels of EMF exposure experienced in everyday life. The National Institutes of Health (NIH 2002) determined that approximately 95% of the U.S. population has an average daily EMF exposure of approximately 4 mG from electrical systems and devices at home and work. Localized EMF levels in proximity to electrical power infrastructure are considerably higher. Typical magnetic fields within 50 feet of power distribution lines range from 10 to 20 mG for main feeders and 3 to 10 mG for laterals under typical loads, reaching as high as 40 to 70 mG under peak loads depending on the amount of current being carried (NIH 2002). Anticipated onshore EMF from offshore wind energy transmission cables would be comparable to, if not lower than, baseline EMF levels generated by existing aboveground electrical infrastructure. Future offshore wind projects would likely generate EMF levels similar to those for the Project. International Commission on Non-Ionizing Radiation Protection (ICNIRP) and International Committee on Electromagnetic Safety (ICES) guidance set exposure levels between 2,000 and 9,040 mG for the general population, although exact levels vary from state to state. The addition of wind energy transmission cables would result in slightly elevated onshore EMF levels.	**Offshore:** There would be no EMF produced during construction of the offshore Project structures. Offshore elements of the Proposed Action such as the WTGs, IAC, and OSS-link cable would generate EMF during operation. The cables produce a magnetic field, both perpendicularly and in a lateral direction around the cables. The calculated magnetic field at a height of 3.3 feet (1 m) above the seafloor is highest directly above the buried cables (IACs, 17 mG; RWECs, 41 mG; and RWEC landfall cables, 39 mG) and decreases rapidly with distance. EMF is reduced to less than 6 mG within 30 feet of the IACs, RWECs, and RWEC landfall cables. All calculated field levels are well below the ICNIRP reference level of 2,000 mG and the ICES exposure reference level of 9,040 mG for exposure of the general public. Therefore, effects would be **negligible** adverse. Impacts would be lower, but still similar, for Alternatives C through F due to the reduction of the number of WTGs and possible reduction of miles of IAC. Reasonably foreseeable future actions would also generate offshore EMF due to the use of similar Project components. However, it is anticipated that reasonably foreseeable future actions would also use similar construction and operations techniques, which includes shielding and protecting cables that are laid directly on the seafloor. Shielded electrical transmission cables do not directly emit electrical fields into surrounding areas but are surrounded by magnetic fields that can cause induced electrical fields in moving water. Due to the rapid dissipation of EMFs surrounding the cables and incorporation of protection measures, there would be a **negligible** adverse cumulative impact on land use and coastal infrastructure for Alternatives B through F. Impacts would be lower, but still similar, for Alternatives C through F due to the reduction of the number of WTGs and possible reduction of miles of IAC. **Onshore:** There would be no EMF produced during construction of the onshore Project structures.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			However, EMF levels decrease very rapidly with distance from the cables. For an 880-MW transmission cable, peak EMF would be 73 mG at the cable but would decrease to 2 mG at 25 feet from the cable. This is well below international EMF standards. The presence of slightly elevated levels of EMF from future offshore wind activities would have no effect on land use and coastal infrastructure because elevated EMF would not alter land use patterns, change land uses, or have any other effect on land use and coastal infrastructure. On this basis, the effects of EMF on land use under the No Action Alternative would be long term **negligible** adverse, as there would be no effect on land use and coastal infrastructure.	Between the TJBs and OnSS, the onshore transmission cables would be installed in a double-circuit underground duct bank. Modeling of the magnetic field levels associated with the operation of these cables calculates the magnetic field at peak loading directly over the duct banks at 73 mG or lower for the maximum 880-MW capacity of the RWF. This is well below the ICNRIP reference level of 2,000 mG and the ICES exposure reference level of 9,040 mG for the general public (Exponent 2020). Lower magnetic fields would be produced if the power generated by the RWF is less than 880 MW. Based on modeled EMF levels for the Proposed Action (Exponent 2020), typical EMF levels at approximately 3 feet (1 m) immediately above the buried cable would be a maximum of 73 mG. Field strength would diminish rapidly with distance, decreasing to near 0 mG within 25 to 50 feet of the cable centerline. These potential effects must be placed in context with typical levels of EMF exposure experienced in everyday life. The NIH (2002) determined that approximately 95% of the U.S. population has an average daily EMF exposure of approximately 4 mG from electrical systems and devices at home and work. Localized EMF levels in proximity to electrical power infrastructure are considerably higher. Typical magnetic fields within 50 feet of power distribution lines range from 10 to 20 mG for main feeders and 3 to 10 mG for laterals under typical loads, reaching as high as 40 to 70 mG under peak loads, depending on the amount of current being carried (NIH 2002). Therefore, the relative level of EMF from the onshore duct bank would be low compared to other electrical infrastructure. The underground transmission cables onshore would not be a direct source of any electric field aboveground due to cable construction, duct bank, and burial underground (vhb 2022). As EMFs would remain well below established thresholds and there would be no direct source of aboveground EMFs, it is anticipated that there would be no impact on land use and coastal infrastructure due to EMFs from O&M of onshore Project facilities. Decommissioning would result in no EMF impacts, similar to construction. Therefore, there would be a **negligible** adverse EMF impact on land use and coastal infrastructure from O&M and decommissioning of onshore elements of Alternatives B through F. Reasonably foreseeable future actions would likely generate EMF levels similar to those for the Project. On this basis, the cumulative effects of EMF on land use under all Project alternatives would be **negligible** adverse

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
				as there would be no effect on land use and coastal infrastructure and Alternatives B through F have identical onshore facilities and activities.
Light: Structures	Various ongoing onshore and coastal construction projects have nighttime activities, as well as existing structures, facilities, and vehicles, that would use nighttime lighting.	Ongoing onshore construction projects involving nighttime activity could generate nighttime lighting. Intensity and extent would vary, depending on the location, type, direction, and duration of nighttime lighting.	See Section 3.14.1.1 for analysis.	See Sections 3.14.2.2 and 3.14.2.3 for analysis of impacts.
New cable emplacement/maintenance	Onshore buried transmission cables are present in the area near the Project onshore and offshore improvements. Onshore activities would only occur where permitted by local land use authorities, which would avoid long-term land use conflicts.	No known proposed onshore structures are reasonably foreseeable and proposed to be located in the geographic analysis area for land use and coastal infrastructure.	See Section 3.14.1.1 for analysis of onshore impacts. Offshore cable activities would not impact onshore land use or infrastructure.	See Sections 3.14.2.2 and 3.14.2.3 for analysis of onshore impacts. Offshore cable activities would not impact onshore land use or infrastructure.
Noise	Ongoing noise from construction occurs frequently near the shores of populated areas in New England and the mid-Atlantic region but infrequently offshore. Noise from construction near shorelines is expected to gradually increase over the next 30 years in line with human population growth along the coast of the geographic analysis area. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary.	No future activities were identified within the geographic analysis area other than ongoing activities.	See Section 3.14.1.1 for analysis.	See Sections 3.14.2.2 and 3.14.2.3 for analysis of impacts.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. The MCT at the Port of New Bedford is a completed facility developed by the port specifically to support the construction of offshore wind facilities.	Ports would need to perform maintenance and upgrade facilities to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size.	Various ports would be improved to support future offshore wind projects (see Appendix E). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. Therefore, ports would experience long-term beneficial impacts such as greater economic activity and increased employment due to demand for vessel maintenance services and related supplies; vessel berthing, loading and unloading; warehousing and fabrication facilities for offshore wind components; and other business activity related to offshore wind. State and local agencies would be responsible for minimizing the potential adverse impacts of these future port expansions by managing port resources and traffic control to ensure continued access to ports and adjacent land uses. There could be increased traffic and noise associated with increased port use that could impact land uses by increasing congestion and noise. However, all traffic, noise, and other adverse impacts would be under regulatory thresholds as ports would be required to comply with local land use and zoning regulations. On this basis, the effects of port	**Offshore:** Land uses impacted by the construction of offshore components would include chosen port facilities used for shipping, storing, and fabricating Project components and for crew transfer, cargo logistics, and storage. Revolution Wind would use one or more ports to offload shipments of components, prepare them for installation, and load components onto vessels for delivery and installation. Selected ports could require improvements or upgrades to meet Project needs (see Table 3.3.10-1 of the COP), but no specific port improvements have been proposed as part of the Proposed Action. The COP states that to the extent that upgrades or modifications at an existing port facility could occur, Revolution Wind expects that those upgrades or modifications would serve to support the U.S. offshore wind industry in general. This is especially true as a number of states continue to procure, support, and fund such development. Thus, whether or not upgrades are required, port facilities are expected to serve multiple offshore wind projects and potentially also offshore wind-related and other maritime industries. BOEM (2016) analyzed potential impacts to ports that could require upgrades to accommodate offshore wind projects or that are in the process of completing upgrades in anticipation of increased port use associated with

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			utilization on land use under the No Action Alternative would be long term **negligible** adverse.	offshore wind projects. BOEM noted that land use and transportation impacts primarily include land-based space conflicts with current or planned uses of adjacent areas and landside traffic delays or conflicts associated with construction. BOEM (2016) also identified potential water-based space conflicts with other uses of port waterways such as dredging, pile driving, and fill placement. The ports under consideration for construction staging are industrial in character, designated by local zoning and land use plans for heavy industrial activity, and typically adjacent to other industrial or commercial land uses and major transportation corridors. Therefore, it is expected that port improvements or upgrades would be subject to local zoning and land use regulations and that any upgrades to ports would undergo independent permitting and regulatory compliance processes. The development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects; however, no specific port improvements are identified as part of the Project. All future port improvements would be subject to independent environmental permitting and regulatory review and would be consistent with local land use and zoning regulations. As such, any future port improvements supporting offshore wind development would be consistent with, and therefore would not hinder, other nearby land use or use of coastal infrastructure. Overall, construction and installation of offshore components would have minor beneficial impacts to land use and coastal infrastructure by supporting designated uses at ports and supporting port improvements and/or redevelopment. Improvements such as road widening and signalization would provide transportation flow benefits over the long term. Because port expansion and upgrades are not part of the Proposed Action and would undergo separate permitting and regulatory review, there would be a negligible adverse port utilization impact on land use and coastal infrastructure from construction and installation of offshore elements of the Proposed Action. Alternatives C through F would slightly reduce impacts to port utilization due to reduction of the number of WTGs and possible reduction of miles of IAC. However, impacts would be similar to the Proposed Action: **negligible** adverse. Offshore O&M facilities would include the RWEC, IAC, OSS interconnection cable, and OSS electrical components. While these offshore components would tie

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				into onshore Project components that could affect land use, the offshore activities and facilities themselves would not directly impact land use. Offshore facilities that tie into onshore facilities could result in increased activity within any of the listed onshore port areas zoned for business and industrial uses. However, this would reinforce the designated land use and provide a source of investment in the coastal infrastructure. Activities at ports, as in the preceding paragraph, would be consistent with the existing and designated uses at other ports and would comply with local zoning and land use regulations. Therefore, there would be a long-term **minor** beneficial and a **negligible** adverse port utilization impact on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action. Impacts would be similar for Alternatives C through F, although slightly reduced, so the impact determination would be the same as the Proposed Action. Port upgrades and vessel activity associated with the Proposed Action could result in incremental impacts through an increase in economic and employment opportunities as well as reduced port access, increased delays and congestion, or increased collision risk. Project port activity and upgrades (via dredging and in-water work) could also coincide with other forecasted projects. Quonset Point is scheduled to undergo remediation at the former NIKE Battery PR-58 and Disaster Village Training Area in 2021. In late 2020, the Rhode Island congressional delegation and the general treasurer joined the Rhode Island Department of Environmental Management in launching a $5.2 million project to make improvements at the Port of Galilee. The project would be located at the North Bulkhead section of the port where heavy-duty commercial fishing piers would be demolished and replaced, bulkhead asphalt repaired, and electrical supply upgraded (Block Island Times 2020). If the Port of Galilee is chosen to support Revolution Wind O&M activities, there would be no Project-related upgrades at the Port of Galilee. Port Jefferson has completed a master plan and an upper port revitalization plan, which is a blight study and urban renewal plan pursuant to New York State law. It involved rezoning certain areas and supporting major housing and mixed-use projects within the town (Village of Port Jefferson 2019). No specific non-Project improvements are proposed for Montauk Harbor, but NYSERDA issued an offshore wind master plan that notes Montauk Harbor as having the potential to be used or developed into

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				facilities capable of supporting offshore wind projects (NYSERDA 2017). Port activities could be delayed or area transportation routes could experience longer delays as a result of the overlap in construction activities. All activities would, however, be in accordance with land use goals and plans and would be subject to local land use and zoning regulations. Construction and operations improvements associated with the Project and other offshore wind energy development would occur within the boundaries of existing port facilities or repurposed industrial facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for development of waterfront infrastructure as well as economic opportunities (see Section 3.11). State and local agencies would also be responsible for minimizing the impacts of these future development plans by ensuring continued access to ports and adjacent land uses and minimizing or avoiding noise, air quality, and other impacts on nearby neighborhoods. Therefore, when considered in combination with past, present, and other reasonably foreseeable projects, the Proposed Action would have **negligible** adverse cumulative impacts on land use and coastal infrastructure. Alternatives C through F would slightly reduce impacts to port utilization, but impacts would remain the same as the Proposed Action: **negligible** adverse.
				Onshore: The Project is evaluating the use of the Port of Davisville at Quonset Point, Port of Galilee, Port Jefferson, and Port of Montauk to support O&M of the Project (see Table 3.3-24 in the COP). O&M buildings at or near some or all of these ports would be used for wind farm monitoring and equipment storage for multiple offshore wind projects—the RWF, SFWF, and Sunrise Wind Farm—and as such have utility that is independent of the Project. If the Port of Galilee or Port of Brooklyn are chosen as O&M facility locations, use of these ports would be limited to existing facilities maintained by these ports. Use of the other ports listed above would include using existing facilities as well as constructing additional facilities to support the RWF and other wind farms. An existing upland building, called the Research Way O&M Building, is located approximately 6 miles from Port Jefferson at 22 Research Way in Setauket-East Setauket, New York. It is located within an office park that also hosts technology companies and health care providers among other businesses. The building was recently purchased by Northeast Offshore, LLC, and internal

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				upgrades to establish office and warehouse space are planned. The planned work requires no governmental authorizations other than local building permits and would consist entirely of interior renovations to create workspaces. No external modifications or expansions are planned other than any necessary repairs to maintain the existing external appearance. The only other external planned work being discussed is maintenance of the parking lot, landscaping, and, potentially, signage. The Research Way facility would also be capable of serving multiple projects as well as general Orsted and Eversource business needs. A new building with up to 1,000 square feet of office space and up to 6,000 square feet of equipment storage would be constructed at the Port of Montauk. This facility could also serve as an O&M base for multiple offshore wind projects. The ports under consideration for construction staging are industrial in character, designated by local zoning and land use plans for heavy industrial activity, and typically adjacent to other industrial or commercial land uses and major transportation corridors. Activities associated with onshore construction of the Project would generate noise, vibration, and vehicular traffic and would temporarily alter views at one or more ports listed in Table 3.3.10-1 of the COP. Port improvements would result in combustion emissions from construction vehicles and equipment and could result in fugitive particulate emissions from soil movement. These impacts would be typical for construction in and operation of industrial ports. Noise, vibration, vehicular traffic increases, and vehicular emission generation would be short term. Potential landside transportation impacts would be minimized through construction hour restrictions, improvements such as road widening and signalization, and appropriate route selection (BOEM 2016). Activity and development from the Project would not occur at levels above those typically experienced or expected at these facilities, would not hinder other nearby land use or use of coastal infrastructure, and would comply with local land use and zoning regulations. Overall, construction and installation of onshore components would have **minor** beneficial impacts to land use and coastal infrastructure by supporting designated uses at ports and port improvements and/or redevelopment. Improvements such as road widening and signalization would provide transportation flow benefits over the long term. Alternatives B through F include identical onshore facilities and activities and impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				Project O&M would involve routine daily activities at O&M facilities that are consistent with the zoned uses for those specific parcels. O&M facilities would include offices, warehouses, and associated accessory uses, which are consistent with the range of land uses associated with the ports listed in Table 3.3.10-1 of the COP. The increased activity within any of the listed port areas zoned for business and industrial uses would reinforce the designated land use and provide a source of investment in the coastal infrastructure. O&M activities would be limited to temporary, periodic use of vehicles and equipment; associated impacts would be consistent with zoned and designated uses for commercial and industrial port facilities. The presence of O&M facilities and related O&M activities would contribute to the economic vitality of ports. O&M of onshore components would therefore have minor beneficial impacts to land use and coastal infrastructure by supporting designated uses at ports and supporting port improvements and/or redevelopment that would benefit other projects and port uses beyond those necessary for the Project (see Section 3.11). Therefore, there would be a long-term **minor** beneficial and a **negligible** adverse port utilization impact on land use and coastal infrastructure from O&M and decommissioning of onshore elements of Alternatives B through F. Development of an offshore wind industry on the mid-Atlantic OCS could incentivize the expansion or improvement of regional ports to support planned and future projects. Potential future activities could include upgrades to port facilities that would have long-term beneficial impacts to other users over a long time period. All future port improvements would be subject to independent environmental permitting and regulatory review and are not part of the Project. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **negligible** adverse on port utilization for Alternatives B through F.
Presence of structures: Viewshed	The only existing offshore structures within the offshore viewshed of the Project are minor features such as buoys.	Non-offshore wind structures that could be viewed in conjunction with the offshore components would be limited to met towers. Marine activity would also occur within the offshore viewshed.	Future offshore wind activities would add 3,008 additional structures within the geographic analysis area. Future offshore wind activities would also result in onshore placement of structures. Structures would be built in accordance with state and local land use, zoning, and building regulations and therefore would have minimal land use and coastal infrastructure impacts. While the presence of additional onshore structures	**Offshore:** The installation and operation of up to 102 offshore structures for the Proposed Action and construction of the IAC, OSS-link cable, and RWEC would not result in any impacts to land use and coastal infrastructure because these impacts would occur offshore and would not overlap with onshore land uses. Therefore, there would be a **negligible** adverse impact from the presence of structures on land use and coastal

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			could impact land uses by reducing the amount of land available for other uses and generating short-term construction impacts, all structures would be built in accordance with state and local zoning and building regulations and would therefore have a minimal impact on land use and coastal infrastructure. On this basis, the effects of the presence of structures on land use under the No Action Alternative would be long term **negligible** adverse.	infrastructure from O&M and decommissioning of offshore elements of Alternatives B through F. Similarly, when considered in combination with past, present, and other reasonably foreseeable projects, the Proposed Action would have no effect on land use and coastal infrastructure; therefore, the cumulative impact would be **negligible** adverse. Alternatives C through F would result in incrementally smaller impacts, but not measurably reduce land use and coastal infrastructure impacts compared to the Proposed Action.
				Onshore: Onshore structures that would be constructed as part of the Project include the onshore transmission cable, ICF, and OnSS. The OnSS would require temporary disturbance (construction footprint) of up to 7.1 acres to facilitate construction. This includes an operational footprint of 3.8 acres. The ICF would require a temporary construction footprint of approximately 4.0 acres, which includes the 1.6-acre operational footprint. The ICF would be constructed adjacent to the existing Davisville Substation, in the zoned Quonset Business Park District. Installation of the ICF could increase visibility of the existing substation to nearby residences along Camp Avenue. However, construction would take place adjacent to the existing Davisville Substation, in lots surrounded by mature trees. Construction activities associated with onshore facilities is expected to take approximately 1 year and includes clearing and grading, excavating, installing foundations, and constructing the facility. There are no nighttime visually sensitive areas (public parks, beaches, or other public recreational facilities) near the OnSS and ICF that would be impacted by nighttime construction lighting (see Section 3.20). The visual impacts of the ICF would be minimized through the installation of vegetation to provide year-round screening from nearby Camp Avenue, Circuit Drive, and Roger Williams Way; appropriate substation siting; low-profile design; and minimal lighting, all of which would be directed downward (vhb 2021). As designed, the interconnection facility would generate sound below existing, ambient sound levels (vhb 2022). According to federal, state, and local noise standards, there would be no impact as a result of the operation of the ICF. All Project-related construction would take place within areas zoned for industrial and commercial development and would be subject to land use and zoning regulations that limit impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				Therefore, the presence of structures would result in a **negligible** adverse impact on land use and coastal infrastructure from construction and installation of onshore elements of all Project alternatives. O&M activities would include periodic inspections and repairs at the ICF and cable access manholes, which would require minimal use of worker vehicles and construction equipment. Periodic maintenance and repairs would have temporary impacts on access to adjacent land uses. All onshore structures that are part of Alternatives B through F and any necessary modifications to structures would be consistent with land use and zoning regulations. Therefore, the impact from the presence of structures on land use and coastal infrastructure would be **negligible** adverse. Reasonably foreseeable future actions would have similar impacts to Alternatives B through F in terms of the presence of structures. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **negligible** adverse on land use and coastal infrastructure for all Project alternatives.

Navigation and Vessel Traffic

No IPFs with solely negligible impacts were identified.

Table E2-14. Summary of Activities and the Associated Impact-Producing Factors for Navigation and Vessel Traffic

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Anchoring	Larger commercial vessels (specifically tankers) sometimes anchor outside of major ports to transfer their cargo to smaller vessels for transport into port, an operation known as lightering. These anchors have deeper ground penetration and are under higher stresses. Smaller vessels (commercial fishing or recreational vessels) would anchor for fishing and other recreational activities. These activities cause temporary to short-term impacts on navigation in the immediate anchorage area. All vessels could anchor in an emergency scenario (such as power loss) if they lose power to prevent them from drifting and creating navigational hazards for other vessels or drifting into structures.	Lightering and anchoring operations are expected to continue at or near current levels, with the expectation of a moderate increase commensurate with any increase in tankers visiting ports. Deep draft vessel visits to major port visits are expected to increase as well, increasing the potential for an emergency need to anchor and creating navigational hazards for other vessels. Recreational activity and commercial fishing activity would likely stay largely the same related to this IPF.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
Port utilization: Expansion	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.	volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.		
Presence of structures: Allisions	An allision occurs when a moving vessel strikes a stationary object. The stationary object can be a buoy, a port feature, or another anchored vessel. There are two types of allisions that occur: drift and powered. A drift allision generally occurs when a vessel is powered down due to operator choice or power failure. A powered allision generally occurs when an operator fails to adequately control their vessel movements or is distracted.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 35 years. Vessel allisions with non–offshore wind stationary objects should not increase meaningfully without a substantial increase in vessel congestion.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
Presence of structures: Fish aggregation	Items in the water, such as ghost fishing gear, buoys, and energy platform foundations can create an artificial reef effect, aggregating fish. Recreational and commercial fishing can occur near the artificial reefs. Recreational fishing is more popular than commercial fishing near artificial reefs because commercial mobile fishing gear can risk snagging on the artificial reef structure.	Fishing near artificial reefs is not expected to change meaningfully over the next 35 years.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
Presence of structures: Navigation hazard	Vessels need to navigate around structures to avoid allisions. When multiple vessels need to navigate around a structure, then navigation is made more complex as the vessels need to avoid both the structure and each other.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 35 years. Even with increased port visits by deep draft vessels, this is still a relatively small adjustment when considering the whole of New England vessel traffic. The presence of navigation hazards is expected to continue at or near current levels.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
Presence of structures: Space use conflicts	Currently, the offshore area is occupied by marine trade, stationary and mobile fishing, and survey activities.	Reasonably foreseeable activities (non–offshore wind) would not result in additional offshore structures.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
New cable emplacement/ maintenance	Within the geographic analysis area for navigation and vessel traffic, existing cables could require access for maintenance activities. Infrequent cable maintenance activities could cause temporary increases in vessel traffic and navigational complexity.	The FCC has two pending submarine telecommunication cable applications in the North Atlantic. Future new cables would cause temporary increases in vessel traffic during installation or maintenance, resulting in infrequent, localized, short-term impacts over the next 35 years. Care would need to be taken by vessels that are crossing the cable routes during these activities.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.
Traffic: Aircraft, vessels, collisions	See Table E2-15 (Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Military and National Security Uses) for a discussion of search and rescue (SAR) aircraft and vessels with respect to traffic. SAR helicopters are the main aircraft that could be flying at low enough heights to risk interaction with WTGs. USCG SAR aircraft need to fly low enough that they can spot objects in the water.	SAR operations could be expected to increase with any increase in vessel traffic. As noted in Table E2-15, no future non–offshore wind stationary structures were identified within the offshore analysis area. Therefore, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations.	See Section 3.16.1.1 for analysis.	See Sections 3.16.2.2 and 3.16.2.3 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	See also the sub-IPF for Presence of structures: Navigation hazard	See also the sub-IPF for Presence of structures: Navigation hazard		

Other Uses: Military and National Security

Table E2-15. Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Military and National Security Uses

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities. Impacts are unlikely to affect military and national security uses.	Fuels and oils would be required for construction, installation, O&M, and decommissioning of future offshore wind activities. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. OSRPs would be required for all future offshore wind projects, which includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. Releases during construction of future offshore wind activities during all phases of project construction would generally be localized and short term, resulting in little change to water quality. Therefore, this IPF would have a **negligible** adverse impact on military and national security uses because there would be no effect on this resource.	**Offshore:** Fuels and oils would be required for offshore construction and installation equipment, vessels, and infrastructure over the 18-month construction period. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. As described in Section 3.21.1.2, the likelihood of a spill due to construction and installation activities and weather events is low (once per 1,000 years). An OSRP has been prepared for the Project and includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. Therefore, this IPF would have a **negligible** adverse impact on military and national security uses. Alternatives C through F would reduce the number of WTGs and their associated IACs, which would have an associated reduction in associated vessel and equipment use. This decrease in WTGs would result in a reduction of possible accidental releases and discharges, but the level of impact would not measurably change relative to the Proposed Action. **Onshore:** Same as offshore impacts.
Anchoring	Impacts from anchoring occur due to ongoing military use and survey, commercial, and recreational activities.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
New cable emplacement/maintenance	Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be local and limited to emplacement corridors.	Cable maintenance or replacement of existing cables in the geographic analysis area would occur infrequently, and would generate short-term disturbances.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Light	Impacts from lighting on military and national security include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	substantially more light on an ongoing basis. Impacts are expected to be minimal.	traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population growth and development over time. Light from onshore structures is expected to gradually increase in line with human population growth along the coast, with minimal offshore impacts.		
Noise	Noise impacts are expected from construction and vessel traffic. Construction occurs frequently in nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	While future offshore wind activities without the Proposed Action would result in construction and decommissioning noise and limited operational noise, noise is not expected to impact military and national security as all noise would be lower than regulatory thresholds and would occur in geographic areas in which the military does not typically operate. Therefore, the effects of noise on military and national security under the No Action Alternative would be **negligible** adverse.	**Offshore:** While construction and installation, O&M and decommissioning of offshore elements of the Proposed Action would result in construction noise, noise is not expected to impact military and national security as all noise would be lower than regulatory thresholds. Alternatives C through F would reduce the number of WTGs and their associated IACs, which would have an associated reduction in noise associated with vessel and equipment use, but otherwise, the level of impact would not measurably change relative to the Proposed Action. Therefore, the effects of noise on military and national security under Alternatives B through F would be **negligible** adverse. The Project combined with reasonably foreseeable future actions would result in an increase in construction and decommissioning noise in the RI/MA WEA. However, noise impacts would be distributed across a large geographic area and would not likely occur at the same time. Noise is not anticipated to impact military or national security. Therefore, because Project activities combined with reasonably foreseeable activities would result in a minimal increase in noise offshore that is not expected to impact military and national security uses, the cumulative impacts would be **negligible** adverse. **Onshore:** Same as offshore impacts.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports. The increased activity could cause potential conflicts with military aircraft and vessels.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, changes in port usage by some fishing or recreational vessel operators, and changes in navigation patterns.	There could be a very minimal increase in vessel use at ports associated with the No Action Alternative. The number of construction vessels would increase due to future offshore wind activities without the Proposed Action, which could result in delays and congestion at ports that could lead to potential conflicts with military aircraft and vessels due to increased activity in the vicinity of the airports listed in the Affected Environment. Port improvements and construction activities in or near ports could require alteration of navigation patterns at nearby airports, which could impact military uses. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed, and all navigation hazards and collision risks would be gradually eliminated during decommissioning as offshore WTGs are removed. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists	**Offshore:** Alternatives B through F would require construction and O&M vessels, which could result in minor delays and congestion at ports. This could lead to potential conflicts with military aircraft and vessels due to increased port activity. Although no port improvements are currently planned as part of Alternatives B through F, if port upgrades are required, port improvements and construction activities in or near ports could require alteration of navigation patterns at nearby airports, which could impact military uses. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction and O&M is completed. Vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. However, port utilization is not expected to increase beyond what is currently allowed under land use regulations. Therefore, port utilization is expected to

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on military and national security.	have a **negligible** adverse effect on military and national security. Although Alternatives C through F would result in a slight reduction of port utilization due to a reduction of the number of WTGs and their associated IACs, impacts on this resource would be similar to the Proposed Action. Project activities combined with reasonably foreseeable activities would result in a minimal increase in port utilization that would be accounted for through port improvements and capacity planning. Therefore, the cumulative impacts of noise on military and national security would be **negligible** adverse.
				Onshore: Same as offshore impacts.
Presence of structures: Allisions	Existing stationary facilities that present allision risks include the five offshore wind turbines associated with the BIWF, dock facilities, meteorological buoys associated with offshore wind lease areas, and other offshore or shoreline-based structures.	No additional non–offshore wind stationary structures were identified within the geographic analysis area. Stationary structures such as private or commercial docks could be added close to the shoreline.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Presence of structures: Fish aggregation	Existing stationary facilities that act as FADs include offshore wind turbines associated with the BIWF.	No future non–offshore wind additional stationary structures that would act as FADs were identified within the geographic analysis area.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Presence of structures: Navigation hazard	Existing stationary facilities within the geographic analysis area that present navigational hazards consist of the five WTGs in the BIWF; onshore wind turbines; communication towers; dock facilities; and other onshore and offshore commercial, industrial, and residential structures.	No future non–offshore wind stationary structures were identified within the offshore analysis area. Onshore, development activities are anticipated to continue, with additional proposed communications towers and onshore commercial, industrial, and residential developments.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Presence of structures: Space use conflicts	Existing stationary facilities within the geographic analysis area that present a navigational hazard include the five WTGs in the BIWF; onshore wind turbines; communication towers; dock facilities; and other onshore and offshore commercial, industrial, and residential structures.	No future non–offshore wind stationary structures were identified within the offshore analysis area. Onshore, development activities are anticipated to continue, with additional proposed communications towers and onshore commercial, industrial, and residential developments.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Presence of structures: Transmission cable infrastructure	Seven submarine cable corridors cross cumulative lease areas.	Submarine cables would remain in current locations with infrequent maintenance continuing along those cable routes for the foreseeable future.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Traffic: Vessels, collisions	Current vessel traffic in the region is described in Section 3.16.1. Vessel activities associated with offshore wind in the cumulative lease areas is currently limited to site assessment surveys.	Continued vessel traffic in the region is described in Section 3.16.1.	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.
Traffic: Aviation	Onshore and offshore military and national security use areas could have designated surface and subsurface boundaries and special use airspace. Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be	See Section 3.17.1.3 for analysis.	See Sections 3.17.2.4 and 3.17.2.9 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments. Warning Area W-105A is a special use airspace area primarily used by the U.S. Air Force located offshore Massachusetts and Rhode Island, and overlapping the RI and MA lease areas.	expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.		
Climate Change	Climate change has resulted in a measurable increase in annual precipitation on the East Coast, which could impact military and national security-related aviation and air traffic due to more inclement weather incidents.	Sea level rise and storm severity/frequency would increase due to the effects of climate change.	Climate change has resulted in a measurable increase in annual precipitation on the East Coast, which could impact military and national security–related aviation and air traffic due to more inclement weather incidents. Future offshore wind activities could result in construction activities that increase GHG emissions. Increased GHG emissions could contribute to climate change impacts during construction. However, the construction of future offshore wind facilities could ultimately help slow the negative effects of climate change by redistributing some of the East Coast's energy generation to renewable sources, resulting in a net decrease in GHG emissions from energy generation. On this basis, the effects of climate change on military and national security under the No Action Alternative would be **negligible** adverse.	Similar to the No Action Alternative, the construction and installation, O&M, and decommissioning of Alternatives B through F could contribute to climate change impacts during construction. However, the Project could also ultimately help slow the negative effects of climate change by redistributing some of the East Coast's energy generation to renewable sources, resulting in a net decrease in GHG emissions from energy generation. On this basis, the effects of climate change on military and national security under Alternatives B through F would be **negligible** adverse.

Other Uses: Aviation and Air Traffic

Table E2-16. **Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Aviation and Air Traffic**

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges would be ongoing and anticipated to occur in low frequencies. This IPF would therefore not overlap with aviation and air traffic uses and areas.	No future activities were identified within the geographic analysis area other than ongoing activities.	Accidental releases and discharges would not overlap with aviation and air traffic uses and areas and therefore would result in a **negligible** adverse impact.	**Offshore:** The effects of this IPF from Alternatives B through F would not impact aviation and air traffic because accidental releases and discharges would not overlap with aviation and air traffic uses. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource. **Onshore:** Same as offshore impacts.
Anchoring and new cable emplacement/maintenance	Anchoring activities would be ongoing and anticipated to occur in low frequencies. This IPF would therefore not overlap with aviation and air traffic uses and areas.	No future activities were identified within the geographic analysis area other than ongoing activities.	Future offshore wind activities would require adding new cables and maintaining them as part of future wind projects. The offshore effects of anchoring and new cable emplacement/maintenance would have no bearing on aviation or air traffic, as these uses do not overlap. Onshore construction and maintenance of cables associated with future offshore wind activities would occur in areas that are not likely to overlap with aviation uses. The use of onshore construction equipment would	**Offshore:** Onshore construction, maintenance, and decommissioning of cables associated with future offshore wind activities would occur in areas that are not likely to overlap with aviation uses. The use of onshore construction equipment would not interfere with air traffic. On this basis, the effects of anchoring and new cable emplacement/maintenance on aviation and air traffic under Alternatives B through F would be **negligible** adverse.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			not interfere with air traffic. On this basis, the effects of anchoring and new cable emplacement/maintenance on aviation and air traffic under the No Action Alternative would be **negligible** adverse.	**Onshore:** Same as offshore impacts.
Light	Impacts from lighting on aviation and air traffic include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis. Impacts are expected to be minimal.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time. Light from onshore structures is expected to gradually increase in line with human population growth along the coast, with minimal offshore impacts.	See Section 3.17.1.1 for analysis.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts.
Noise	Noise impacts are expected from construction and vessel traffic. Construction occurs frequently in nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Noise is not expected to impact aviation and air traffic.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	While future offshore wind activities without the Proposed Action would result in construction and decommissioning noise and limited operational noise, noise is not expected to impact aviation and air traffic. Therefore, the effects of noise on aviation and air traffic under the No Action Alternative would be **negligible** adverse.	**Offshore:** All Project-associated noise would comply with regulatory noise thresholds and noise is not expected to impact aviation and air traffic. Alternatives C through F could result in a slight reduction to construction and operational noise but otherwise would be similar to the Proposed Action. Therefore, the effects of noise on aviation and air traffic under Alternatives B through F would be **negligible** adverse. Reasonably foreseeable future actions would occur over a dispersed geographic area and would not generate noise high enough to impact aviation uses. Therefore, the cumulative impacts would also be **negligible** adverse.
				Onshore: There would be onshore noise impacts associated with the construction of Alternatives B through F. Construction would be limited to daylight hours, and noise impacts would consist of noise generated from heavy equipment performing clearing, grading, excavating, installing foundations, and heavy lifting of substation components. Noise modeling shows that noise is expected to remain below Town of North Kingstown noise ordinance levels. Because there is no permanent noise-generating equipment associated with the onshore transmission cable, operational noise of the underground cables is expected have no impacts to aviation and air traffic. The OnSS and ICF, as designed, would generate sound similar to or below existing ambient sound levels; therefore, operational noise levels would not have an impact on aviation and air traffic. It is expected that reasonably foreseeable future actions would have similar noise impacts to Alternatives B through F. Therefore, impacts associated with the Project

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				when combined with past, present, and reasonably foreseeable future activities would be **negligible** adverse on aviation and air traffic.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports. The increased activity could cause potential impacts to aviation and air traffic.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports.	See Section 3.17.1.1 for analysis.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts.
Presence of structures: Navigation hazard	Existing aboveground stationary facilities within the geographic analysis area that present navigational hazards include the five WTGs in the BIWF, onshore wind turbines, communication towers, dock facilities, and other onshore and offshore structures exceeding 200 feet in height.	No future non–offshore wind stationary structures were identified within the offshore analysis area. Onshore development activities are anticipated to continue with additional proposed communications towers.	See Section 3.17.1.1 for analysis.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts.
Presence of structures: Space use conflicts	Existing aboveground stationary facilities within the geographic analysis area that could cause space use conflicts for aircraft consist of the five WTGs associated with the BIWF, onshore wind turbines, communication towers, and other onshore and offshore structures exceeding 200 feet in height.	No future non–offshore wind stationary structures were identified within the offshore analysis area. Onshore, development activities are anticipated to continue with additional proposed communications towers.	See Section 3.17.1.1 for analysis.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts.
Traffic: Aviation	Onshore and offshore military and national security use areas could have designated surface and subsurface boundaries and special use airspace. Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments. Warning Area W-105A is a special use airspace area primarily used by the U.S. Air Force located offshore Massachusetts and Rhode Island, and overlapping the RI and MA lease areas.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	See Section 3.17.1.1 for analysis for offshore impacts. This IPF would not impact onshore uses.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts for offshore impacts. This IPF would not impact onshore uses.
Traffic: Vessels	No substantial changes are anticipated to the vessel traffic volumes. The geographic analysis area would continue to have numerous ports, and the extensive marine traffic related to shipping, fishing, and recreation would continue to be important to the region's economy.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic.	See Section 3.17.1.1 for analysis.	See Sections 3.17.2.2 and 3.17.2.7 for analysis of impacts.
Climate change	Climate change has resulted in a measurable increase in annual precipitation on the East Coast, which could	Sea level rise and storm severity/frequency would increase due to the effects of climate change.	Future offshore wind activities could result in construction activities that increase GHG emissions. Increased GHG emissions could contribute to climate	**Offshore:** Alternatives B through F could result in GHG emissions during Project construction, O&M, and decommissioning phases as well as offset negative effects

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	impact military and national security–related aviation and air traffic due to more inclement weather incidents.		change impacts. Climate change has resulted in a measurable increase in annual precipitation on the East Coast, which could impact aviation and air traffic due to more inclement weather incidents. However, the construction of future offshore wind facilities would ultimately help slow the negative effects of climate change by redistributing some of the East Coast's energy generation to renewable sources. On this basis, the effects of climate change on aviation and air traffic under the No Action Alternative would be **negligible** adverse.	of climate change by redistributing some of the East Coast's energy generation to renewable sources. Therefore, the effects of climate change on aviation and air traffic under Alternatives C through F would be **negligible** adverse.
				Onshore: Same as offshore impacts.

Other Uses: Cables and Pipelines

Table E2-17. Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Cables and Pipelines

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities.	The effects of this IPF from the No Action Alternative would not impact undersea cables because accidental releases and discharges would result in water quality impacts that do not impact undersea cables. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore:** The effects of this IPF from Alternatives B through F would not impact undersea cables because accidental releases and discharges would result in water quality impacts that do not impact undersea cables. Alternatives C through F would require fewer construction, O&M, and decommissioning vessel trips, reducing the risk of accidental releases and discharges, but there would be no measurable change on effects between all Project alternatives. Therefore, this IPF would result in a **negligible** adverse impact and **negligible** adverse cumulative impact under Alternatives B through F because there would be no effect on this resource.
				Onshore: Same as offshore impacts.
Anchoring and new cable emplacement/maintenance	Impacts from this IPF occur due to ongoing military use and survey, commercial, and recreational activities. These disturbances would be limited to local areas but do not overlap with cables and pipeline activities.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Cable emplacement/maintenance would be infrequent and short term.	The presence of future offshore wind energy cables could preclude future submarine cable placement within any given development footprint, requiring future cables to route around these areas. However, the placement and presence of these cables would not prohibit the placement of additional cables and pipelines. Following standard industry procedures, cables and pipelines can be crossed without adverse impacts. The risk of allision to cable maintenance vessels could increase as more offshore wind energy projects are constructed. However, given the infrequency of required maintenance at any given location along a cable route, this risk is expected to be low. Impacts on submarine cables would be eliminated during decommissioning of offshore wind farms if export cables associated with those projects are removed.	**Offshore:** The installation of the RWEC would cross submarine cables that run through the regional waters. Most submarine cables pass through Green Hill, Rhode Island. In addition, there are NOAA nautical chart cable and pipeline areas that denote where such infrastructure could be located. Because Revolution Wind would use standard techniques during installation, O&M, and decommissioning to prevent damage to cables, adverse impacts would be **negligible** adverse. The effects of this IPF would be the same or slightly reduced from the Proposed Action under Alternatives C through F. Up to 4,209 miles of cables are expected to be installed between 2021 and 2030 in the RI/MA WEA as part of reasonably foreseeable future actions. However, the placement and presence of these cables would not

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			Therefore, the effects of anchoring and new cable emplacement/maintenance on undersea cables under the No Action Alternative would be **negligible** adverse.	prohibit the placement of additional cables and pipelines. Impacts on undersea cables would be eliminated during decommissioning of offshore wind farms if export cables associated with those projects are removed. Therefore, Project activities combined with reasonably foreseeable activities would result in a **negligible** adverse impact on undersea cables. **Onshore:** Same as offshore impacts.
Light	Impacts from lighting include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Impacts are expected to be minimal.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time.	Future offshore wind activities without the Proposed Action would result in an increase in permanent aviation warning lighting on WTGs offshore. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize allision risks. Implementation of navigational lighting and marking per FAA and BOEM requirements and guidelines would further reduce the risk of vessel collisions during installation or maintenance of undersea cables. This would result in a general increase of lights in the geographic analysis area, which could have a small negative impact on vessels performing cable construction or maintenance by increasing navigational complexity. However, given that no new cables associated with non–wind energy actions are anticipated, the effects of light on undersea cable construction or maintenance under the No Action Alternative would be **negligible** adverse.	**Offshore:** Lighting for construction, operations, and decommissioning under all Project alternatives would not impact undersea cables because light has no impact on undersea cables. Alternatives C through F would result in smaller Project footprints and fewer lighted offshore structures than the Proposed Action, but the reduction of impacts would not be measurable. This IPF would result in **negligible** adverse impacts because there would be no effect on this resource. **Onshore:** Same as offshore impacts.
Noise	Ongoing noise from construction occurs frequently nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. Noise from construction near shorelines is expected to gradually increase over the next 30 years in line with human population growth along the coast of the geographic analysis area.	No future activities were identified within the geographic analysis area other than ongoing activities.	The effects of this IPF from the No Action Alternative would not impact undersea cables because noise has no impact on existing undersea cables or the construction or maintenance of undersea cables. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore:** Project construction, operations, and decommissioning noise would not impact undersea cables because noise has no impact on undersea cables. Alternatives C through F would result in smaller Project footprints and fewer offshore structures than the Proposed Action, but the reduction of impacts would not be measurable. This IPF would result in **negligible** adverse impacts because there would be no effect on this resource. **Onshore:** Same as offshore impacts.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in port usage. The increased activity could cause potential navigational complexity.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.	There could be a very minimal increase in vessel use at ports associated with the No Action Alternative. Vessels used for undersea cable installation and maintenance of existing or future non–wind energy cables could conflict with vessels used for construction, O&M and decommissioning of future offshore wind actions by increasing congestion and delays at ports. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Port utilization is also not expected to	**Offshore:** Vessels used for the Project could impact installation and O&M of other undersea cables by increasing congestion and delays at ports. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Port utilization is also not expected to increase beyond what is currently allowed under land use regulations; therefore, port utilization that supports Alternatives B through F would have **negligible** adverse impacts on existing and future undersea cables.

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
			increase beyond what is currently allowed under land use regulations; therefore, port utilization that supports future offshore wind activities would not impact the construction, operation, and maintenance of existing and future undersea cables. Therefore, there would be **negligible** adverse impacts from increased port utilization for the construction, operation, and maintenance of existing and future undersea cables.	**Onshore:** Same as offshore impacts.
Presence of structures: Allisions and navigation hazards	Structures within and near the geographic analysis area that pose potential allision hazards include the five BIWF WTGs; met buoys associated with offshore wind lease areas; and shoreline developments such as docks, ports, and other commercial, industrial, and residential structures.	Reasonably foreseeable non–offshore wind structures that could affect submarine cables have not been identified in the geographic analysis area.	See Section 3.17.1.5 for analysis.	See Sections 3.17.2.6 and 3.17.2.11 for analysis of impacts.
Presence of structures: Space use conflicts	Submarine cables cross the geographic analysis area and are associated with a larger network of submarine cables that are present along the OCS.	Reasonably foreseeable non–offshore wind structures have not been identified in the geographic analysis area.	See Section 3.17.1.5 for analysis.	See Sections 3.17.2.6 and 3.17.2.11 for analysis of impacts.
Presence of structures: Transmission cable infrastructure	Seven submarine cable corridors cross cumulative lease areas.	Reasonably foreseeable non–offshore wind structures have not been identified in the geographic analysis area.	See Section 3.17.1.5 for analysis.	See Sections 3.17.2.6 and 3.17.2.11 for analysis of impacts.
Traffic: Aviation	Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	Future offshore wind activities could result in increased air traffic due to the use of helicopters and other aircraft during construction, installation, O&M, and decommissioning of future wind projects. While the exact increase in future project-related flights is unknown, it is anticipated that future offshore wind activities would result in a small increase in flight traffic. Future offshore wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. With implementation of FAA-approved flight plans, impacts of the No Action Alternative on undersea cables would be **negligible** adverse.	**Offshore:** Aviation and air traffic impacts from offshore construction, O&M, and decommissioning of the Project would not coincide with areas in which undersea cables are located. While Alternatives C through F would require fewer Project-related helicopter trips due to the reduction in number of offshore elements, the effects of this IPF on undersea cables and pipelines would be **negligible** adverse under all Project alternatives. **Onshore:** Same as offshore impacts.
Traffic: Vessels	No substantial changes are anticipated to vessel traffic volumes. The geographic analysis area would continue to have numerous ports, and the extensive marine traffic related to shipping, fishing, and recreation would continue to be important to the region's economy.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic.	See Section 3.17.1.5 for analysis.	See Sections 3.17.2.6 and 3.17.2.11 for analysis of impacts.
Climate change	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters and sea level rise.	No future activities were identified within the geographic analysis area other than ongoing activities.	The effects of this IPF from the No Action Alternative would not impact undersea cables because undersea cables and cable placement are not impacted by ongoing or future climate change impacts. This IPF would result in	**Offshore:** The impacts of this IPF would not impact undersea cables for Alternatives B through F because climate change impacts do not have a measurable effect on undersea cables. This IPF would result in **negligible**

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			a **negligible** adverse impact because there would be no effect on this resource.	adverse impacts because there would be no effect on this resource. Same as offshore impacts.

Other Uses: Radar Systems

Table E2-18. **Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Radar Systems**

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities.	The effects of this IPF from the No Action Alternative would not impact land-based radar because accidental releases and discharges would be limited in scope to the offshore and onshore areas occupied by future offshore wind activities and would not result in increased radar interference. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore:** The effects of this IPF from Alternatives B through F would not impact land-based radar because accidental releases and discharges from the Project would be limited to the areas in which construction, O&M, and decommissioning are taking place and would not be located near land-based radar systems, nor would land-based radar systems be affected by accidental releases and discharges. While Alternatives C through F would require fewer Project-associated vessel trips, incrementally reducing the risk of accidental releases and discharges, the effects under all Project alternatives would be similar. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource. **Onshore:** Same as offshore impacts.
Anchoring and new cable emplacement/maintenanc e	Impacts from this IPF occur due to ongoing military use and survey, commercial, and recreational activities. These disturbances would be limited to local areas and are not expected to increase radar interference.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Cable emplacement/maintenance would be infrequent and short term.	Offshore energy facility new cable emplacement and maintenance of cables would involve increased vessel traffic, which could create increased radar interference. However, the impacts are expected to be small and short term because anchoring and cable emplacement/maintenance activities are short-term activities that require few vessels. On this basis, the effects of anchoring and new cable emplacement/maintenance on land-based radar under the No Action Alternative would be **negligible** adverse.	**Offshore:** Cable construction associated with Alternatives B through F could result in increased vessel traffic, which could create increased radar interference. However, the impacts are expected to be small and short term in duration because anchoring and cable emplacement activities are short term and infrequent activities that require few vessels. Impacts under Alternatives C through F would be slightly reduced due to smaller Project footprints and fewer offshore structures, but effects would be similar under all Project alternatives. On this basis, the effects of anchoring and new cable emplacement/maintenance on land-based radar under Alternatives B through F during Project construction, O&M, and decommissioning would be **negligible** adverse. Up to 2,148 acres could be affected by anchoring/mooring activities during offshore wind energy development within the geographic analysis area in addition to Alternatives B through F. However, the impacts are expected to be small and short term. Therefore, the cumulative impacts associated with Alternatives B through F when combined with past,

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				present, and reasonably foreseeable activities would be similar to those impacts described under the No Action Alternative and would be **negligible** adverse.
				Onshore: Same as offshore impacts.
Light	Impacts from lighting include light associated with military, commercial, or construction vessel traffic but are not expected to result in radar interference.	No future activities were identified within the geographic analysis area other than ongoing activities.	The effects of this IPF from the No Action Alternative would not impact land-based radar because light from future offshore wind activities would not affect radar systems. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore:** Light from construction, O&M, and decommissioning of Alternatives B through F would not affect radar systems. This IPF would result in a **negligible** adverse effect on the operation and effectiveness of land-based radar systems because there would be no effect on this resource. The cumulative effects of this IPF do not impact land-based radar and are therefore **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
				Onshore: Same as offshore impacts.
Noise	Noise impacts are expected from construction and vessel traffic but are not expected to result in radar interference.	No future activities were identified within the geographic analysis area other than ongoing activities.	The effects of this IPF from the No Action Alternative would not impact land-based radar because noise from future offshore wind activities would not affect radar systems. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore:** Airborne noise from construction of the Proposed Action would have a **negligible** adverse effect on land-based radar systems because noise from future offshore wind activities would not affect radar systems. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
				Onshore: Same as offshore impacts.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports. Impacts are expected to be minimal.			**Offshore:** Various ports would be improved to support the Proposed Action (see Section 3.14). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. The number of construction vessels associated with the Proposed Action would increase, which could result in vessel congestion at ports, but this would be a short-term effect. An increase in vessel traffic could result in increased radar interference. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Because port utilization is not expected to increase beyond what is currently allowed under land use regulations, port utilization is expected to have a **negligible** adverse effect on land-based radar. Although Alternatives C through F

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse. **Onshore:** Same as offshore impacts.
Presence of structures: Navigation hazards	Wind developments in the direct line-of-sight with, or extremely close to, radar systems can cause clutter and interference. Existing wind developments in the area include scattered onshore wind turbines and five WTGs in the BIWF.	Reasonably foreseeable non–offshore wind structures proposed for construction in the lease areas that could affect radar systems have not been identified.	See Section 3.17.1.2 for analysis.	See Sections 3.17.2.3 and 3.17.2.8 for analysis of impacts.
Traffic: Aviation	Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	Future offshore wind activities without the Proposed Action could result in increased air traffic due to the use of helicopters and other aircraft during construction, installation, O&M, and decommissioning of future wind projects. While the exact increase in future project-related flights is unknown, it is anticipated that future offshore wind activities would result in a small increase in flight traffic. Future offshore wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. With implementation of FAA-approved flight plans, impacts of the No Action Alternative on land-based radar would be **negligible** adverse.	**Offshore:** The Proposed Action would result in an increase in air traffic related to construction and installation of offshore Project elements. Two helicopter trips per day are anticipated per day during construction, with a total flight time of 8,832 hours, or approximately 4,416 hours per year over the 2-year construction period. Extrapolating from nationwide statistics cited in Section 3.17.2.2.1, helicopter flights for Project construction would represent a 63% increase in annual helicopter flight hours and a 7% increase in general aviation flight hours in the geographic analysis area during Project construction. O&M of the Proposed Action would result in a 0.01% increase in general aviation in the geographic analysis area. A helicopter route plan would be developed to meet industry guidelines and best practices in accordance with FAA guidance. The addition of one to two helicopter trips per day would have a **negligible** adverse impact on land-based radar in the geographic analysis area. The Proposed Action would result in an average 1% increase in general aviation in the geographic analysis area over a 32-year construction, installation, O&M, and decommissioning period, with reasonably foreseeable future actions anticipated to have similar impacts in scale and duration. On the basis of a 1% increase in general aviation in the geographic analysis area, the cumulative effects of this IPF on land based radar would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse. **Onshore:** Same as offshore impacts.
Traffic: Vessels	No substantial changes are anticipated to vessel traffic volumes. The geographic analysis area would continue to	Absent other information, and because total vessel transits in the area have remained relatively stable since	See Section 3.17.1.2 for analysis.	See Sections 3.17.2.3 and 3.17.2.8 for analysis of impacts.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
	have numerous ports and extensive marine traffic related to shipping, fishing, and recreation.	2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic		
Climate change				**Offshore:** The Proposed Action could result in construction, O&M and decommissioning activities that increase GHG emissions. Increased GHG emissions could contribute to climate change impacts. However, the beneficial impacts to climate change would be increased due shifting energy sources from nonrenewable to renewable sources, which would help offset additional future additional negative effects of climate change. Climate change impacts from the Proposed Action would not impact land-based radar because the construction, operation, and maintenance of land-based radar systems is not affected by climate change that can be linked to the Proposed Action. Therefore, the effects of climate change on land-based radar under the Proposed Action would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
				Onshore: Same as offshore impacts.

Other Uses: Scientific Research and Surveys

Table E2-19. Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Scientific Research and Surveys

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities.	Fuels and oils would be required for construction and installation, O&M, and decommissioning of future offshore wind activities. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. OSRPs would be required for all future offshore wind projects, which includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. Releases during construction of future offshore wind activities during all phases of project	**Offshore:** Fuels and oils would be required for Proposed Action offshore construction and installation, O&M, and decommissioning equipment, vessels, and infrastructure. In the event of a spill or release, offshore water quality would be degraded. As described in Section 3.21.1.2, the likelihood of a spill due to construction and installation activities and weather events is low (once per 1,000 years). However, water quality could be temporarily impacted in the vicinity of the spill. This could alter results of scientific surveys that are water quality dependent. An OSRP has been prepared for the Project and includes processes for rapid spill response, containment, cleanup,

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			construction would generally be localized and short term, resulting in little change to water quality. In the event of a spill, water quality could be temporarily impacted, which could alter water quality in the vicinity of the spill. This could alter results of scientific surveys that are water quality dependent. However, an OSRP has been prepared for the Project and includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. Therefore, the effects of accidental releases and discharges on scientific research and surveys from future offshore wind activities without the Proposed Action would be **negligible** adverse.	and other measures that would help minimize impacts on water quality from spills. Therefore, the effects of accidental releases and discharges on scientific research and surveys from the Proposed Action would be **negligible** adverse. Reasonably foreseeable activities could also result in accidental releases and discharges, although those projects would be subject to the same minimization measures as the RWF. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse. **Onshore:** The construction and installation of onshore Project components would not impact scientific research and surveys because accidental releases and discharges would be limited to an onshore construction footprint and scientific research and surveys would occur offshore. This IPF would result in a **negligible** adverse impact.
Anchoring and new cable emplacement/maintenance	Impacts from this IPF occur due to ongoing military use and survey, commercial, and recreational activities. These activities potentially increase navigational complexity and vessel traffic but are expected to minimally impact scientific research and surveys.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Cable emplacement/maintenance would be infrequent and short term.	See Section 3.17.1.4 for analysis.	See Sections 3.17.2.5 and 3.17.2.10 for analysis of impacts.
Light	Impacts from lighting on scientific research and surveys include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis. Impacts are expected to be minimal.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time. Light from onshore structures is expected to gradually increase in line with human population growth along the coast, with minimal offshore impacts.	See Section 3.17.1.4 for analysis.	See Sections 3.17.2.5 and 3.17.2.10 for analysis of impacts.
Noise	Noise impacts are expected from construction and vessel traffic. Construction occurs frequently in nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Planned new barge routes and dredging disposal sites would generate vessel noise when	Construction and installation of future offshore wind projects would result in temporary increases in construction and decommissioning noise. There would be low levels of operational noise as part of future offshore wind projects. Construction noise has the potential to	**Offshore and Onshore:** Construction and installation of the Proposed Action would result in a temporary increase in construction noise. O&M and decommissioning of the Proposed Action would result in long-term, permanent low levels of operational noise and temporary noise

Associated IPFs: Sub-IPFs	**Ongoing Activities**	**Future Non–Offshore Wind Activities Intensity/Extent**	**Future Offshore Wind Activities Intensity/Extent**	**Action Alternatives B through F**
	are local and temporary. Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	implemented. The number and location of such routes are uncertain.	interfere with scientific research and surveys if such surveys are sensitive to noise impacts. However, construction noise levels are expected to be below regulatory thresholds and would be short term in duration. Operational noise impacts are expected to be very minimal and would also be below regulatory thresholds. Therefore, noise would have a **negligible** adverse impact on scientific research and surveys.	during decommissioning. These noise sources have the potential to interfere with scientific research and surveys if such surveys are sensitive to noise impacts. However, because NMFS anticipates that construction and O&M of the Project would result in curtailment of scientific research and surveys in the geographic analysis area, noise would have a **negligible** adverse impact on scientific research and surveys. Reasonably foreseeable activities would also increase noise in the area, which could interfere with scientific research and surveys. However, reasonably foreseeable future actions would also result in curtailment of scientific research and surveys in the RI/MA WEA as additional wind projects are constructed. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in port usage. The increased activity could increase navigational complexity and vessel traffic.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, and changes in port usage by some fishing or recreational vessel operators.	Various ports would be improved to support future offshore wind development within the geographic analysis area (see Section 3.14). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. The number of construction vessels would increase due to future offshore wind activities without the Proposed Action, which could result in delays and congestion at ports that could lead to potential conflicts with scientific research vessels due to increased port activity. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed, and all navigation hazards and collision risks would be gradually eliminated during decommissioning as offshore WTGs are removed. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on scientific research and surveys.	**Offshore and Onshore:** Various ports would be improved to support the Proposed Action (see Section 3.14). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. Because port utilization is not expected to increase beyond what is currently allowed under land use regulations, port utilization that supports the Proposed Action would not impact scientific research and surveys. The number of construction and operational vessels would increase due to the Proposed Action, which could result in delays and congestion at ports that could lead to conflicts with scientific and research vessels. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on scientific research and surveys. Reasonably foreseeable future actions would also result in improvements at various ports to support future offshore wind projects (see Appendix E). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would also support

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				state strategic plans and local land use goals for the development of waterfront infrastructure. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Presence of structures: Navigation hazards	Stationary structures are limited in the open ocean environment of the geographic analysis area and include met buoys associated with site assessment activities, the five BIWC WTGs, and the two Coastal Virginia Offshore Wind (CVOW) WTGs. Other lease areas within the geographic analysis area are not yet developed and are in various stages of permitting.	Reasonably foreseeable non–offshore wind activities would not implement stationary structures within the open ocean environment that would pose navigational hazards and raise the risk of allisions for survey vessels and collisions for survey aircraft.	See Section 3.17.1.4 for analysis.	See Sections 3.17.2.5 and 3.17.2.10 for analysis of impacts.
Traffic: Aviation	Military air traffic use the area and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	Future offshore wind activities without the Proposed Action could result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects. While the exact increase in future project-related flights is unknown, it is anticipated that future offshore wind activities would result in a small increase in flight traffic. Future offshore wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. With implementation of FAA-approved flight plans, impacts of the No Action Alternative on scientific research and surveys would be **negligible** adverse.	**Offshore and Onshore:** Construction and installation of the Proposed Action would result in a 7% increase in general aviation in the geographic analysis area. O&M of the Proposed Action would result in a 0.01% increase in general aviation in the geographic analysis area. Please refer to Section 3.17 for analysis of the Project's construction and installation impacts. On the basis of the estimated increase in general aviation in the geographic analysis area, the effects of this IPF on scientific research and surveys under the Proposed Action would be **negligible** adverse, as the 7% increase in general aviation flight hours is not anticipated to impact air-based scientific research and surveys. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Traffic: Vessels	No substantial changes are anticipated to the vessel traffic volumes. The geographic analysis area would continue to have numerous ports and extensive marine traffic related to shipping, fishing, and recreation.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic.	See Section 3.17.1.4 for analysis.	See Sections 3.17.2.5 and 3.17.2.10 for analysis of impacts.
Climate change	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters and sea level rise.	No future activities were identified within the geographic analysis area other than ongoing activities.	The ongoing effects of global climate change are expected to adversely affect many marine resources that are the subject ongoing survey and research efforts. Climate	**Offshore and Onshore:** The ongoing effects of global climate change are expected to adversely affect many marine resources that are the subject of ongoing survey

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			change could influence the planning and objectives of future scientific research and surveys but would not be expected to have a measurable effect on their implementation. Therefore, the effects of this IPF on scientific surveys and research would be **negligible** adverse.	and research efforts. Climate change could influence the planning and objectives of future scientific research and surveys but would not be expected to have a measurable effect on their implementation. Therefore, the effects of this IPF on scientific surveys and research would be **negligible** adverse. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.

Other Uses: Offshore Energy Uses

Affected environment: The OCS near the Project is currently experiencing active leasing and exploration in support of offshore wind energy development. Appendix E provides a list of known and anticipated offshore wind project and wind energy leases existing in the area that could lead to additional wind farm development. BOEM anticipates that developers could continue to propose offshore wind energy projects near the Project. The trend in increased wind farm development is anticipated to continue on the OCS. Several tidal energy projects have been implemented in the region and several are in the planning stages (see Appendix E of the COP). Tidal energy projects are typically located in the nearshore environment where landforms constrict tidal water passage, thereby increasing the velocity of tidal currents. These landforms exist in Narragansett Bay within the geographic analysis area; however, more detailed studies are needed to assess sites and determine economic viability for tidal energy uses (Robichaud et al. 2012). The Town of Edgartown has pursued developing a tidal energy site in the Muskeget Channel between Martha's Vineyard and Nantucket Island since 2007. It has operated as a test site and is usable for a wide range of testing. To date, over $2 million has been expended on resource, benthic, sediment, marine mammal, and other studies. The Bourne Tidal Test Site is located on Cape Cod Canal has been used for small tidal energy demonstration projects (New England Marine Energy Development System 2017).

Table E2-20. Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Offshore Energy Uses

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue a similar trend to ongoing activities.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Because offshore energy projects occur within individual lease areas, there would be no opportunity for the RWF to directly overlap or substantially interfere with other renewable energy projects. Therefore, accidental releases and discharge associated with the RWF would not impact other offshore energy projects; This IPF would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Anchoring and new cable emplacement/ maintenance	Impacts from this IPF occur due to ongoing military use and survey, commercial, and recreational activities. These activities potentially increase navigational complexity and vessel traffic.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Cable emplacement/maintenance would be infrequent and short term.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Because offshore energy projects occur within individual lease areas, there would be no opportunity for the RWF to directly overlap or substantially interfere with other renewable energy projects. Therefore, anchoring and new cable emplacement/maintenance associated with the RWF would not impact other offshore energy projects; This IPF would result in a **negligible** adverse

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Light	Impacts from lighting on offshore energy uses include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time. Light from onshore structures is expected to gradually increase in line with human population growth along the coast, with minimal offshore impacts.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for standalone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Because offshore energy projects occur within individual lease areas, there would be no opportunity for the RWF to directly overlap or substantially interfere with other renewable energy projects. Therefore, light impacts associated with the RWF would not impact other offshore energy projects; This IPF would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Noise	Noise impacts are expected from construction and vessel traffic. Construction occurs frequently in nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Because offshore energy projects occur within individual lease areas, there would be no opportunity for the RWF to directly overlap or substantially interfere with other renewable energy projects. Therefore, noise associated with the RWF would not impact other offshore energy projects; This IPF would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports. The increased activity could cause potential conflicts with other offshore energy uses.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, changes in port usage by some fishing or recreational vessel operators, and changes in navigation patterns.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** If construction time frames with other offshore wind energy project overlap, there could be increased impacts to construction ports. Such impacts are not anticipated to affect construction timelines or alter the layouts of other renewable energy projects. For this reason, impacts are deemed **negligible** adverse for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Presence of structures: Navigation hazards	Stationary structures are limited in the open ocean environment of the geographic analysis area and include met buoys associated with site assessment activities, the five BIWF WTGs, and the two CVOW WTGs. Other lease areas within the geographic analysis area are not yet developed and are in various stages of permitting.	Reasonably foreseeable non–offshore wind activities would not implement stationary structures within the open ocean environment that would pose navigational hazards and raise the risk of allisions for survey vessels and collisions for survey aircraft.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses.	**Offshore** Because offshore energy projects occur within individual lease areas, there would be no opportunity for the RWF to directly overlap or substantially interfere with other renewable energy projects. Therefore, this IPF would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Traffic: Aviation	Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Construction and installation of the Proposed Action would result in a 7% increase in general aviation in the geographic analysis area. O&M of the Proposed Action would result in a 0.01% increase in general aviation in the geographic analysis area. On the basis of the estimated increase in general aviation in the geographic analysis area, the effects of this IPF on offshore energy uses under the Proposed Action would be **negligible** adverse for the Proposed Action. Although Alternatives C through F would require fewer construction vessel and helicopter trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Traffic: Vessels	No substantial changes are anticipated to vessel traffic volumes. The geographic analysis area would continue to have numerous ports and extensive marine traffic related to shipping, fishing, and recreation.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** If construction or O&M time frames with other offshore wind energy project overlap, there could be increased navigation risk due to an increase in vessels in the geographic analysis area. Such impacts are not anticipated to affect construction timelines or alter the layouts of other renewable energy projects. For this reason, adverse impacts to other renewable energy projects are deemed **negligible** adverse for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Climate change	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters and sea level rise.	No future activities were identified within the geographic analysis area other than ongoing activities.	Construction and operation of offshore energy projects are expected between 2021 and 2030. This use is not carried forward for stand-alone cumulative analysis because the impact of offshore wind is already evaluated as part of all other IPFs and uses. The reader is referred to other subsections for evaluation of the impacts of future offshore wind on marine uses.	**Offshore** Climate change impacts from the Proposed Action would not have a measurable effect on other offshore energy uses. This IPF would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.

Other Uses: Marine Mineral Resources and Dredged Material Disposal

Affected environment: BOEM's Marine Minerals Program manages non-energy minerals (primarily sand and gravel) in federal waters of the OCS and leases access to these resources to target shoreline erosion, beach renourishment, and restoration projects. At this time, there are no active or requested BOEM leases near the Project. The closest active BOEM lease is offshore of New Jersey, approximately 162 miles from the Project (BOEM 2018). One USACE borrow area (7A) is located offshore the town of Wainscott, in the vicinity of the RWEC.

The EPA designates and manages dredged material disposal sites, and the USACE permits the disposal of material in the sites. One active disposal site, the Rhode Island Sound Disposal Site, is located in the geographic analysis area approximately 3 miles east of Block Island, Rhode Island, and 10 miles west of the western boundary of the proposed RWF. No inactive or closed disposal sites are located in the geographic analysis area.

Increased shoreline erosion and coastal damage from storms has led to increased demand for sand resources in recent years.

Table E2-21. Summary of Activities and the Associated Impact-Producing Factors for Other Uses: Marine Mineral Resources and Dredged Material Disposal

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
Accidental releases and discharges	Accidental releases and discharges of fuels and fluids occur during vessel usage for dredge material ocean disposal, fisheries use, marine transportation, military use, survey activities, and submarine cable line and pipeline laying activities.	Future accidental releases from offshore vessel usage, spills, and consumption would likely continue on a similar trend to ongoing activities.	Fuels and oils would be required for construction, installation, O&M, and decommissioning of future offshore wind projects. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. OSRPs would be required for all future offshore wind projects, which includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. Releases during construction of future offshore wind projects during all phases of project construction would generally be localized and short term, resulting in little change to water quality. In the event of a spill, marine mineral resources could potentially be impacted if such resources are susceptible to harm from contaminants, although the impacts would be very minimal. Therefore, the effects of vessel traffic on marine mineral resources and dredged material disposal under the No Action Alternative would be **negligible** adverse.	**Offshore and Onshore:** Fuels and oils would be required for Proposed Action offshore construction and installation, O&M, and decommissioning equipment, vessels, and infrastructure. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. As described in Section 3.21.1.2, the likelihood of a spill due to construction and installation activities and weather events is low (once per 1,000 years). An OSRP has been prepared for the Project and includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. A release during construction and installation of the Proposed Action would generally be localized and short term, resulting in little change to water quality. In the event of a spill, marine mineral resources could potentially be impacted if such resources are susceptible to harm from contaminants, although the impacts would be very minimal. Therefore, the effects of accidental releases and discharges on marine mineral resources and dredged material disposal under the Proposed Action would be **negligible** adverse. Reasonably foreseeable activities could also result in accidental releases and discharges, although those projects would be subject to the same minimization measures as the RWF. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint and duration of construction activities, but effects would also be **negligible** adverse.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
New cable emplacement/maintenance	Impacts from this IPF occur due to ongoing military use and survey, commercial, and recreational activities. Infrequent cable maintenance activities disturb the seafloor and cause temporary increases in suspended sediment; these disturbances would be local and limited to emplacement corridors.	Impacts from anchoring could occur on a semiregular basis over the next 35 years due to offshore military operations, survey activities, commercial vessel traffic, and/or recreational vessel traffic. Cable emplacement/maintenance would be infrequent and short term.	Future offshore cable installation could prevent future marine mineral extraction activities where project footprints overlap with extraction areas (typically within 8 miles of the shoreline). Therefore, only a portion of new offshore wind cables could potentially overlap extraction areas. Additionally, future projects would avoid identified borrow areas by consulting with the BOEM Marine Minerals Program and the USACE before approving offshore wind cable routes. Therefore, the effects of anchoring and new cable emplacement/maintenance under the No Action Alternative would be **negligible** adverse.	**Offshore and Onshore:** Because marine mineral resources and EPA dredged material disposal sites are located outside the geographic analysis area, Project anchoring and new cable emplacement/maintenance would result in a **negligible** adverse impact for the Proposed Action. Although Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall duration of construction activities relative to the Proposed Action, impacts would also be **negligible** adverse.
Light	Impacts from lighting on offshore energy uses include light associated with military, commercial, or construction vessel traffic. Ocean vessels have an array of lights, including navigational lights and deck lights. Offshore buoys and towers emit low-intensity light. Onshore structures, including houses and ports, emit substantially more light on an ongoing basis.	Future activities with the potential to result in lighting impacts include construction and operation of undersea transmission lines, gas pipelines, and other submarine cables (e.g., telecommunications); marine minerals use and ocean-dredged material disposal; military use; marine transportation; fisheries use and management; and oil and gas activities. Light pollution from vessel traffic would continue at the current intensity along the Northeast coast, with a slight increase due to population increase and development over time. Light from onshore structures is expected to gradually increase in line with human population growth along the coast, with minimal offshore impacts.	The effects of this IPF from the No Action Alternative would not impact marine mineral resources and dredged material disposal because light from future offshore wind activities would not affect marine mineral resources and dredged material disposal sites or activities. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore and Onshore:** The effects of this IPF from the Proposed Action to marine mineral resources and dredged material disposal would be **negligible** adverse because marine mineral resources and EPA dredged material disposal sites are located outside the geographic analysis area. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint, duration of construction activities, but effects would also be **negligible** adverse.
Noise	Noise impacts are expected from construction and vessel traffic. Construction occurs frequently in nearshores of populated areas in New England and the Mid-Atlantic but infrequently offshore. The intensity and extent of noise from construction is difficult to generalize, but impacts are local and temporary. Vessel noise occurs offshore and more frequently near ports and docks. Ongoing activities that contribute to this IPF consist of commercial shipping, recreational and fishing vessels, and scientific and academic research vessels. Vessel noise is anticipated to continue at or near current levels.	Noise from construction near shorelines is expected to gradually increase in line with human population growth along the coast of the geographic analysis area for this resource. Planned new barge routes and dredging disposal sites would generate vessel noise when implemented. The number and location of such routes are uncertain.	The effects of this IPF from the No Action Alternative would not impact marine mineral resources and dredged material disposal because noise from future offshore wind activities would not affect marine mineral resources and dredged material disposal. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore and Onshore:** The effects of this IPF from the Proposed Action to marine mineral resources and dredged material disposal would be **negligible** adverse because marine mineral resources and EPA dredged material disposal sites are located outside the geographic analysis area. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint, duration of construction activities, but effects would also be **negligible** adverse.
Port utilization	The major ports in the United States are seeing increased vessel visits, as vessel size also increases. Ports are also experiencing continual upgrades and maintenance. Impacts from these activities would be short term and could include congestion in ports, delays, and changes in navigation patterns at nearby airports. The increased activity could cause increased navigational complexity and increased vessel traffic.	Ports would need to perform maintenance and upgrades to ensure that they can still receive the projected future volume of vessels visiting their ports and be able to host larger deep draft vessels as they continue to increase in size. Impacts would be short term and could include congestion in ports, delays, changes in port usage by some fishing or recreational vessel operators, and changes in navigation patterns.	The effects of this IPF from the No Action Alternative would be **negligible** adverse on marine mineral resources and dredged material disposal because port utilization and potential increased vessel traffic resulting from the No Action Alternative are not expected to overlap with BOEM lease areas or EPA dredged material disposal sites.	**Offshore and Onshore:** Various ports would be improved to support the Proposed Action (see Section 3.14). The number of construction and maintenance vessels associated with the Proposed Action would increase which could result in vessel congestion at ports and potential collision risk with marine mineral resource or dredging vessels leaving or returning to ports, but this would be a minimal increase in vessel traffic. Also, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
				a **negligible** adverse effect on marine mineral resources and dredged material disposal. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint and duration of construction activities, but effects would also be **negligible** adverse.
Presence of structures: Navigation hazards	Stationary structures are limited in the open ocean environment of the geographic analysis area, and include met buoys associated with site assessment activities, the five BIWF WTGs, and the two CVOW WTGs. Other lease areas within the geographic analysis area are not yet developed and are in various stages of permitting.	Reasonably foreseeable non–offshore wind activities would not implement stationary structures within the open ocean environment that would pose navigational hazards and raise the risk of allisions for survey vessels and collisions for survey aircraft.	Future offshore WTGs and OSSs could prevent future marine mineral extraction activities where project footprints overlap with extraction areas. However, this is unlikely as mineral extraction typically occurs within 8 miles of the shoreline. Therefore, there would be no risk of overlap with offshore structures, and their presence would have a **negligible** adverse effect on this resource.	**Offshore and Onshore:** There are no BOEM OCS sand and mineral lease areas and no identified sand resource blocks within the RWF and offshore RWEC; therefore, the Project and other reasonably foreseeable activities would have no impacts from structures or cable placement on these marine mineral resources. Similarly, because Project activities would not overlap any active dredged material disposal sites, the Project would have a **negligible** adverse impact on dredged material disposal. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint, duration of construction activities, but effects would also be **negligible** adverse.
Traffic: Aviation	Military air traffic use the area, and government and other private aircraft could occasionally fly over the WEA for data collection and SAR operations. Aircraft are also used for scientific and academic surveys in marine environments.	Although no future non–offshore wind stationary structures were identified within the offshore analysis area, aircraft would continue to be used to conduct scientific research studies as well as wildlife monitoring and preconstruction surveys. SAR operations could be expected to increase with any increase in vessel traffic. However, because vessel traffic volume associated with future non–offshore wind is not expected to increase appreciably, neither should SAR operations. Commercial air traffic could also be expected to increase with current trends.	The effects of this IPF from the No Action Alternative would not impact marine mineral resources and dredged material disposal because aviation and air traffic are air- and land-based impacts that do not overlap with marine mineral resources and dredged material disposal uses. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Offshore and Onshore:** The effects of this IPF from the Proposed Action would not impact marine mineral resources and dredged material disposal because aviation and air traffic are air- and land-based impacts that would not impact underwater marine mineral resources and dredged material disposal. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint, duration of construction activities, but effects would also be **negligible** adverse.
Traffic: Vessels	No substantial changes are anticipated to the vessel traffic volumes. The geographic analysis area would continue to have numerous ports and extensive marine traffic related to shipping, fishing, and recreation.	Absent other information, and because total vessel transits in the area have remained relatively stable since 2010, BOEM does not anticipate vessel traffic to greatly increase over the next 30 years. Even with increased port visits by deep draft vessels and consistent generation of new vessel traffic by proposed barge routes and dredging demolition sites, this is still a relatively small adjustment when considering the whole of New England vessel traffic	Construction and operational vessel traffic from future offshore wind development is expected to increase. This could create conflicts with vessels undergoing marine mineral extraction and dredged disposal activities. However, because future offshore wind activities would take place within the RI/MA WEA and there is no marine mineral extraction or dredged material disposal areas that overlap, this impact is expected to be **negligible** adverse.	**Offshore and Onshore:** Construction and operational vessel traffic from the Proposed Action is expected to occur. This could create conflicts with vessels undergoing marine mineral extraction and dredged disposal activities. However, because the Proposed Action would take place within the RI-MA WEA and there is no marine mineral extraction or dredged material disposal areas that overlap, this impact is expected to be **negligible** adverse. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint and duration of construction activities, but effects would also be **negligible** adverse.
Climate change	Climate change, influenced in part by GHG emissions, is expected to continue to contribute to a gradual warming of ocean waters and sea level rise.	No future activities were identified within the geographic analysis area other than ongoing activities.	Future offshore wind activities without the Proposed Action could result in construction activities that increase GHG emissions. Increased GHG emissions could	**Offshore and Onshore:** The Proposed Action could result in offshore and onshore construction, O&M, and decommissioning activities that increase GHG emissions.

Associated IPFs: Sub-IPFs	Ongoing Activities	Future Non–Offshore Wind Activities Intensity/Extent	Future Offshore Wind Activities Intensity/Extent	Action Alternatives B through F
			contribute to climate change impacts. However, the construction of future offshore wind facilities would ultimately help slow the negative effects of climate change by redistributing some of the East Coast's energy generation to renewable sources. While negative impacts of climate change could affect marine mineral resources due to ocean acidification and other negative effects of climate change, future offshore wind activities without the Proposed Action are expected to help slow the negative impacts of climate change overall. Therefore, the effects of climate change under the No Action Alternative would be **negligible** adverse.	Increased GHG emissions could contribute to climate change impacts. However, O&M would help slow the negative effects of climate change by redistributing some of the East Coast's energy generation to renewable sources and reducing net GHG emissions in the area. While negative impacts of climate change could affect marine mineral resources due to ocean acidification and other negative effects of climate change, the Proposed Action is expected to help slow the negative impacts of climate change overall. Therefore, the effects of climate change under the Proposed Action by itself combined with other reasonably foreseeable projects would be **negligible** adverse. Alternatives C through F would require fewer construction vessel trips and WTGs and would reduce the overall footprint and duration of construction activities, but effects would also be **negligible** adverse.

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APPENDIX E2

Assessment of Resources with Minor (or Less) Impact Determinations

Contents

Figures

Tables

Assessment of Resources with Minor Impact Determinations

This appendix provides an assessment of resources with minor or lower incremental impacts from implementation of the Proposed Action and other considered action alternatives. Because these sections were originally part of Chapter 3 of the Revolution Wind Farm and Revolution Wind Export Cable Project environmental impact statement (EIS), chapter and section naming and numbering were maintained for simplicity. All abbreviations and references for these sections are provided in the main EIS and Appendix B, respectively.

3.4 Air Quality

3.4.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Air Quality

Geographic analysis area: The spatial scale for analysis of potential effects to air quality encompasses 1) the airshed within 25 miles of the estimate Project center (corresponding to the OCS Lease Area) and 2) the airshed within 15.5 miles of onshore construction areas and ports that may be used for the Project. These two areas collectively make up the air quality geographic analysis area (GAA) (Figure 3.4-1) (see COP Figure 4.2.1-1). The air quality GAA encompasses the region subject to U.S. Environmental Protection Agency (EPA) review as part of an OCS permit for the Project under the Clean Air Act (CAA) and provides a reasonable buffer for the limited Project vessel and equipment emissions anticipated to occur within on-land construction areas and mustering port(s) outside of the OCS air permit area during proposed construction activities.

For the purposes of this analysis, the existing air quality conditions for each county within the GAA were evaluated. These counties comprise Providence and Washington Counties in Rhode Island, Suffolk and Kings Counties in New York, New London County in Connecticut, Gloucester County in New Jersey, Bristol and Dukes Counties in Massachusetts, Norfolk City in Virginia, and Baltimore County in Maryland.

Affected environment: The scope of the affected environment for the assessment of potential Project-related emissions and impacts to ambient air quality encompasses offshore areas and those states and counties where Project activities could occur. Project construction and O&M activities could use several regional existing port facilities as discussed in COP Section 3.3.10.1 and COP Table 3.3.10-1.

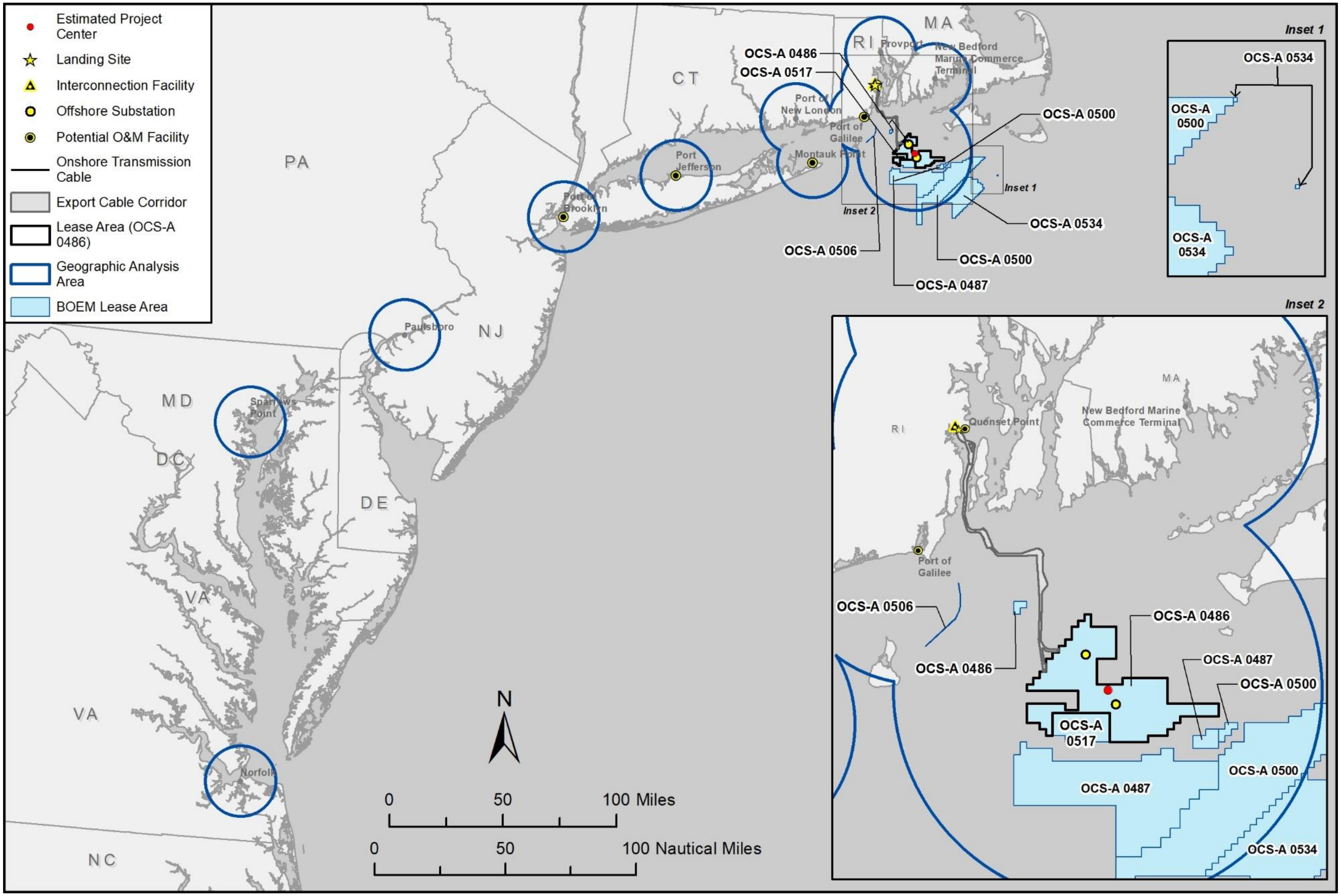

Figure 3.4-1. Geographic analysis area for air quality.

Air quality within a region is measured in comparison to the National Ambient Air Quality Standards (NAAQS), which are standards established by the EPA under the CAA (42 USC 7409) for criteria pollutants. The EPA has developed these standards to protect human health and welfare (primary standards) and provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings (secondary standards). The criteria pollutants for which NAAQS have been established are carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter 10 microns or less (PM_{10}), particulate matter 2.5 microns or less ($PM_{2.5}$), nitrogen dioxide (NO_2), ozone (O_3), and lead. The EPA uses design values to designate and classify nonattainment areas. A design value is a statistic that describes pollutant levels at a given location so they can be compared to the NAAQS. Nonattainment occurs if any criteria air pollutant concentration design value exceeds its NAAQS. The CAA amendments of 1990 established the nonattainment designations as marginal, moderate, and serious. If a region is designated as nonattainment for a NAAQS, the CAA requires the state to develop a state implementation plan (SIP). A SIP provides for the implementation, maintenance, and enforcement of the NAAQS, and includes emission limitation and control measures to attain and maintain the NAAQS. The CAA also prohibits federal agencies from approving any activity that does not conform to a SIP, and this prohibition applies only with respect to nonattainment or maintenance areas (i.e., areas that were previously nonattainment and for which a maintenance plan is required). Conformity to a SIP means conformity to a SIP'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 BOEM lacks any continuing program responsibility over activities potentially within any nonattainment area. Therefore BOEM's approval of the COP is not subject to the requirement to show conformity.

The areas of attainment for criterial pollutants within the GAA reported by the EPA (2021a) are in Table 3.4-1.

Table 3.4-1. U.S. Environmental Protection Agency Areas of Attainment for Criteria Pollutants

Location	EPA Reporting
Rhode Island, including all counties	Currently in attainment for all criteria pollutants.
Norfolk City, Virginia	Currently in attainment for all criteria pollutants.
Bristol County, Massachusetts	Currently in attainment for all criteria pollutants, but Dukes County is currently in marginal nonattainment for the 2008 8-hour O_3 standard.
Suffolk and Kings Counties, New York	Currently in serious nonattainment for the 2008 8-hour O^3 standard, moderate nonattainment for the 2015 8-hour O^3 standard, and in maintenance for the 2006 24-hour $PM_{2.5}$ standard.
Gloucester County, New Jersey	Currently in marginal nonattainment for both the 2008 8-hour O_3 standard and the 2015 8-hour O_3 standard and is also in maintenance for the 2006 24-hour $PM_{2.5}$ standard.
New London County, Connecticut	Currently in serious nonattainment for the 2008 8-hour O^3 standard and marginal nonattainment for the 2015 8-hour O_3 standard.
Baltimore County, Maryland	Currently in moderate nonattainment for the 2008 8-hour O^3 standard, marginal nonattainment for the 2015 8-hour O_3 standard, and nonattainment for the 2010 SO^2 standard.

Additional descriptions of air quality conditions for counties in nonattainment status are provided below.

Dukes County, Massachusetts, is an island community with a relatively low population density and little heavy industry. As is common in the northeastern region, non-road engines used for construction activities and on-road vehicle traffic are the main sources of nitrogen oxide (NO_X) in Dukes County (EPA 2020a). Vegetation sources and non-road engines are the primary volatile organic compound (VOC) emission sources in Dukes County. VOC and NO_X are precursor pollutants to the formation of O_3. Although the EPA currently classifies Dukes County as being in marginal nonattainment for the 2008 8-hour O_3 standard, ambient air quality monitors in Dukes County reported a steady decrease in O_3 levels from 2012 to 2015 (EPA 2021b). The EPA also recently (August 2018) designated Dukes County in attainment for the more stringent 2015 8-hour O_3 standard of 70.0 parts per billion (ppb) based on the 2014–2016 O_3 design value of 64.3 ppb (EPA 2021b). Recently, Dukes County reported an O_3 design value of 70.0 ppb for the 2016–2018 time period, 71.0 ppb for the 2017–2019 time period, and 66.0 ppb for the 2018–2020 time period (EPA 2021b).

Suffolk and Kings Counties, New York, have a high population density and Suffolk County sees the highest amount of commuter miles traveled in the New York metro area (EPA 2017). Suffolk County reported a steady decrease in O_3 concentration levels from 2017 to 2020 (EPA 2021b). The O_3 design value based on observations at the Riverhead air monitor in Suffolk County was 76.7 ppb during the 2015–2017 time period, 75.3 ppb for the 2016–2018 time period, 72.0 ppb for the 2017–2019 time period, and 70.0 ppb for the 2018– 2020 time period (EPA 2021b). There is no O_3 air monitor within Kings County. The nearby air monitor in Queens County reported a decrease in O_3 concentration levels from 2018 to 2020. The O_3 design value based on observations at the Queens College air monitor in Queens County was 74.0 during the 2015–2017 time period, 74.0 ppb for the 2016–2018 time period, 74.0 ppb for the 2017–2019 time period, and 70.0 ppb for the 2018–2020 time period (EPA 2021b). Thus, the EPA currently classifies Kings and Suffolk Counties as being in serious nonattainment for 8-hour O_3 according to the 2008 standard and in moderate nonattainment for the 2015 standard. Both counties are also in maintenance for the 2006 24-hour $PM_{2.5}$ standard. The EPA reports that on-road vehicles are the primary source of NO_X emissions emitted within Kings and Suffolk Counties; non-road engines are the second-largest source. Vegetation sources, solvent use in industry, off-highway engines, and on-road vehicles provide the most VOC emissions emitted within Kings and Suffolk Counties (EPA 2020a).

Gloucester County, New Jersey, has a much lower population density than Suffolk and Kings Counties, New York. Air quality within Gloucester County is affected by nearby Philadelphia. NO_X emissions in Gloucester County are primarily from on-road vehicles, with fuel combustion for industrial purposes, electric generation, and other needs being the second-largest source. Storage and transport, vegetation, and solvent use are the primary sources of VOC emissions in Gloucester County (EPA 2020a). Although the EPA currently classifies Gloucester County as being in marginal nonattainment for the 2008 and 2015 8-hour O_3 standards, the ambient air quality monitor in Gloucester County reported a steady decrease in O_3 levels from 2018 to 2020 (EPA 2021b). Gloucester County reported an O_3 design value of 74.0 ppb for the 2015–2017 and 2016–2018 time periods, 72.0 ppb for the 2017–2019 time period, and 69.0 ppb for the 2018–2020 time period (EPA 2021b).

New London County, Connecticut, is a rural county with a low population density and small industrial bases. Neighboring metro areas outside this county heavily affect the air quality of the county in addition to regional sources. For this reason, changes to pollutant emissions by sources within the county have little impact on the overall air quality trends. NO_X emissions in New London County are primarily from on-road vehicles, with fuel combustion for industrial purposes, electric generation, and other needs being the second-largest source. Vegetation sources and solvent use are the primary sources of VOC emissions (EPA 2020a). Although the EPA currently classifies the county as being in serious nonattainment for the 2008 8-hour O_3 standard and marginal nonattainment for the 2015 8-hour O_3 standard, the ambient air quality monitor in the county reported a small decrease in O_3 levels from 2018 to 2020 (EPA 2021b). New London County reported an O_3 design value of 76.0 ppb for the 2015–2017 time period, 75.0 ppb for the 2016–2018 and the 2017–2019 time periods, and 73.0 ppb for the 2018–2020 time period (EPA 2021b).

Baltimore County, Maryland, has a population density three times greater than New London County, Connecticut. Although the EPA currently classifies Baltimore County as being in moderate nonattainment for the 2008 8-hour O_3 standard and marginal nonattainment for the 2015 8-hour O_3 standard, ambient air quality monitors in Baltimore County reported a steady decrease in O_3 levels from 2018 to 2020 (EPA 2021b). The O_3 design value based on observations at the Essex air monitor in Baltimore County was 73.0 ppb for the 2015–2017 and 2016–2018 time periods, 72.0 ppb for the 2017–2019 time period, and 69.0 ppb for the 2018–2020 time period (EPA 2021b). In Baltimore County, NO_X emissions are primarily from on-road vehicles, with fuel combustion for industrial purposes, electric generation, and other needs being the second-largest source. Vegetation, solvent use, and on-road vehicles are the main sources of VOC emissions (EPA 2020a). The EPA has also classified Baltimore County as being in nonattainment for the 2010 SO_2 standard, although the SO_2 air quality monitor in Baltimore County has reported a steady decline in SO_2 concentration levels since 2016 (EPA 2021b). Baltimore County reported an SO_2 design value of 13.0 ppb for the 2015–2017 time period, 11.0 ppb for the 2016–2018 time period, 10.0 ppb for the 2017–2019 time period, and 9.0 ppb for the 2018–2020 time period (EPA 2021b). The main source of SO_2 emissions in Baltimore County comes from fuel combustion for electric generation (EPA 2020a).

The Ozone Transport Region (OTR) was established by operation of law under CAA Section 184 and comprises the states of Connecticut, Delaware, Maine, Massachusetts, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; the District of Columbia; and the portion of Virginia that is within the Consolidated Metropolitan Statistical Areas that includes the District of Columbia. Congress established the OTR in the 1990 CAA amendments based on the recognition that the transport of ozone and ozone precursors throughout the region may render the states' attainment strategies interdependent. States within the OTR may have similar permitting requirements as ozone nonattainment areas.

Table 3.4-2 presents the total emission inventory in tons per year (tpy) for select regulated pollutants (i.e., CO, NOX, PM_{10}, $PM_{2.5}$, SO2, and VOC) in nonattainment counties in 2017.

Table 3.4-2. Nonattainment Counties, 2017 Emission Inventory for Regulated Pollutant (tpy)

County, State	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC
New London County, Connecticut	25,671.25	5,300.74	2,882.84	1,072.31	289.57	15,606.98
Dukes County, Massachusetts	6,395.82	989.64	407.96	135.99	13.07	2,740.63
Baltimore County, Maryland	71,702.20	10,661.44	12,184.54	3,207.24	1,041.34	16,919.12
Gloucester County, New Jersey	30,399.73	6,260.63	2,161.41	1,311.48	599.94	10,507.34
Kings County, New York	59,473.56	13,571.74	4,959.06	2,559.52	477.53	17,660.21
Suffolk County, New York	146,719.86	20,336.81	9,682.55	3,889.70	1,197.73	32,676.35

Source: EPA (2020a)

The CAA provides special air quality protection to national parks larger than 6,000 acres and national wilderness areas larger than 5,000 acres that were in existence before August 1977 (National Park Service 2020). These areas are referred to as Class I areas and are managed by the U.S. Forest Service (USFS), National Park Service (NPS), and U.S. Fish and Wildlife Service (USFWS). Designation as a Class I area allows only very small increments of new pollution above already existing air pollution levels. One of the purposes of the Prevention of Significant Deterioration permitting program under the CAA, is to preserve, protect, and enhance the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value. Air quality related values (AQRVs) are used to determine whether these resources may be adversely affected by a change in air quality. Federal land managers AQRVs include visibility, vegetation, water quality, soils, and impacts to fish and wildlife. The potential harm from air pollution to these resources depends on quantity of emission, the type of air emission exposure, and the sensitivity of the resources. Current visibility conditions and trends in Class I areas are established via the IMPROVE (Interagency Monitoring of Protected Visual Environments) program. The nearest Class I areas to the Proposed Action are Lye Brook Wilderness, located approximately 155 miles northwest of the Lease Area, and Brigantine Wilderness, located approximately 190 miles southwest of the Lease Area. The Lye Brook Wilderness IMPROVE monitor is located on the ski slopes of Mount Snow approximately 9.5 miles southeast of the Lye Brook Wilderness Area boundary. The Brigantine Wilderness is made up of three separate areas; all three are part of the Edwin B. Forsythe National Wildlife Refuge. The Brigantine Wilderness IMPROVE monitor is located at the Edwin B. Forsythe National Wildlife Refuge Visitor Center, approximately 4 miles west and 4 miles south-southwest of the two closest Brigantine Wilderness Area boundaries. Visibility at both the Lye Brook Wilderness and Brigantine Wilderness Class I areas has been steadily improving since 2010 (Federal Land Manager Environmental Database 2021). No visibility or deposition modeling was conducted as part of this EIS analysis because both Lye Brook Wilderness and Brigantine Wilderness Class I areas are located more than 155 miles away from the Lease Area. If further visibility modeling is required, it will be conducted during the OCS permitting process.

Climate Change: Climate change is a global issue that results from the increase in greenhouse gases (GHGs) in the atmosphere. An analysis of regional climate impacts prepared by the Fourth National

Climate Assessment (U.S. Global Change Research Program 2018) concludes that the rate of warming in the Northeast has markedly accelerated over the past few decades, with seasonal differences in temperature decreasing in recent years as winters have warmed three times faster than summers. Higher temperatures from the increase of GHGs in the atmosphere increase the number of heat events and extreme rain events that cause coastal flooding. The higher temperatures also extend the duration of the pollen season. Analysis of past records and future projections indicates an overall increase in regional temperatures, including near the Lease Area. The most recently available data on GHG emissions in the United States indicate that annual GHG emissions in 2019 were an estimated 6,558 million metric tons of carbon dioxide equivalents (CO2e) (EPA 2021c).

3.4.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential air quality impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

Air emissions and climate change: Under the No Action Alternative, assuming no other future offshore wind projects are developed, electric generation needs would continue to be met by fossil fuel–generating technologies, resulting in more air emissions than what would be expected should future offshore wind development occur. Specific impacts would depend on the type of fossil fuel used (natural gas, oil, coal), the technology and pollution control systems chosen, and the site-specific issues associated with individual electric generation facilities. However, the continued use of existing fossil fuel–combusting electric generation sources would result in annual emissions that could have been avoided by using non–fossil fuel energy sources. These emissions, presented in Table 3.4-3, were estimated using the EPA's Avoided Emissions and geneRation Tool (AVERT) version 3.1.1 for the New England region based on the design capacity of the offshore wind projects that would not be developed.

Table 3.4-3. Estimated Annual Avoided Emissions (tpy) for the Operation of Future Offshore Wind Projects within the Geographic Analysis Area

Limit	CO_2	NO_X	SO_2	$PM_{2.5}$	VOC	NH_3
Lower limit	23,850,536.17	3,913.91	1,656.71	683.25	444.27	616.16
Upper limit	33,414,814.35	5,480.48	2,313.53	956.94	622.17	862.57

Source: BOEM (2021); EPA (2020b)

Notes: Avoided emissions are presented in tons per year and were obtained using the EPA's AVERT (EPA 2020b). AVERT limits the maximum input generation capacity for the New York region to 1,300 MW, which, according to AVERT, is to limit any project from displacing more than approximately 30% of regional fossil generation in any hour. For each of the offshore wind projects within the GAA with a generation capacity greater than 1,300 MW, the avoided emissions were calculated via AVERT based on a 1,300-MW energy generation capacity. AVERT avoided emission values were then scaled up to represent the full energy generation capacity for offshore wind projects with a generation capacity greater than 1,300 MW. For example, an offshore wind project generating 2,600 MW would have twice the avoided emissions values calculated by AVERT for a 1,300-MW offshore wind project.

The lower limit represents the sum of the avoided emissions, as calculated by AVERT, for all of the various offshore wind projects within the GAA limited to a maximum energy generation capacity of 1,300 MW per project. The upper limit represents the sum of the avoided emissions for the same offshore wind projects based on their actual energy generation capacity, scaling up the avoided emission values for the projects with an energy generation capacity greater than 1,300 MW.

Assuming the development of other future wind development and other renewable energy sources, these sources would decrease emissions over the long term, likely reduce the need for traditional fossil fuel power generation in the region, and could result in improved air quality when compared to expected air quality without other future wind development and renewable energy sources. Adjacent states have also proposed emission-reduction targets and renewable goals that overlap the operations of the Project and that are aimed at reducing air emissions and shifting energy sources from traditional fossil fuel generation to cleaner sources of energy. These plans could further reduce, but would not eliminate, air emissions.

During construction, impacts from future wind development activities on air quality under the No Action Alternative would be temporary **minor** to **moderate** adverse, depending on the extent and duration of emissions. Primary emission sources would include increased vessel and air traffic, combustion emissions from construction equipment, and fugitive emissions.

Based on assumed construction schedules, offshore wind development would occur with overlapping construction schedules between 2022 to 2030. As shown in Table 3.4-4, construction of these projects in the GAA with sufficient details to estimate emissions would generate an estimated 25,208 tons of NO_X, 176 tons of SO_2, 781 tons of PM_{10}, and 1,904,101 tons of CO_2 over the 8-year construction period. For comparison purposes, according to the EPA’s 2017 National Emissions Inventory, Suffolk County reported 8,122 tons of NO_X, 124 tons of SO_2, and 872 tons of PM_{10} from highway vehicles; 6,566 tons of NO_X, 34 tons of SO_2, and 537 tons of PM_{10} from off-highway vehicles; and 860 tons of NO_X, 421 tons of SO_2, and 146 tons of PM_{10} from electrical utilities’ combustion of fuel (EPA 2020a). Similarly, future offshore wind project GHG emissions during construction would be negligible (1,904,101 tons of CO_2) as compared to aggregate global emissions, and these projects could beneficially contribute to a broader combination of actions to reduce future impacts from climate change over the long term. 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 0.3-0.8 degrees Celsius (°C) (0.5–1.4 degrees Fahrenheit [°F]) by 2100.

As shown in Table 3.4-5, the O&M of future offshore wind projects in the GAA would have a proportionally small contribution of long-term and intermittent emissions, including 1,212 tons of NO_X, 4 tons of SO_2, 33 tons of PM_{10}, and 111,535 tons of CO_2.

3.4.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on air quality associated with the Project would not occur. However, ongoing and future activities would have continuing temporary to long-term impacts on air quality, primarily through construction-related air emissions.

BOEM anticipates that the impacts of ongoing activities, such as air emissions and GHGs, would be moderate adverse. In addition to ongoing activities, reasonably foreseeable activities other than offshore wind could also contribute to impacts on air quality. Reasonably foreseeable activities, other than offshore wind, that will increase air emissions and GHGs include construction and operation of new energy generation facilities to meet future power demands as transportation and heating become increasingly electrified. Although states are developing onshore renewable energy facilities (through their state energy plans) to the extent practicable to help meet future demand, these state plans also depend on the development of offshore wind. Therefore, under the No Action Alternative, to the extent that offshore wind is not developed, there would be a shortfall from planned renewable power generation, and nonrenewable sources would likely be needed to meet future demand. These facilities could include new natural gas–fired power plants or coal-fired, oil-fired, or clean coal–fired plants. BOEM anticipates that the impacts of reasonably foreseeable activities other than offshore wind would be **moderate** adverse. BOEM expects the combination of ongoing activities and reasonably foreseeable activities other than offshore wind to result in **moderate** adverse impacts on air quality, primarily driven by recent market and permitting trends indicating future electric generating units would most likely include natural gas–fired and oil-fired dual fuel facilities, a mix of natural gas, and dual fuel natural gas/oil.

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 be **minor** to **moderate** adverse. Emissions generated from construction and decommissioning of the offshore wind projects would be the primary source of impacts to air quality. Other future offshore wind projects could also lead to reduced emissions from fossil fuel–combusting power generation facilities, resulting in **minor** to **moderate** beneficial impacts on air quality.

Table 3.4-4. Projected Construction Emissions (tons) for Carbon Dioxide and Regulated Pollutant for Projects in the Geographic Analysis Area from 2022 to 2030

Project	CO_2	NO_X	SO_2	CO	PM_{10}	$PM_{2.5}$	VOC
New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])	30,628	238	3	99	4	4	6
Sunrise, OCS-A 0487	637,986	5,876	6	2,441	108	108	138
South Fork, OCS-A 0517	97,026	1,451	33	284	49	47	59
New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])	85,811	1,256	7	292	50	49	27
Remaining Massachusetts/Rhode Island Lease Area	1,052,650	16,388	127	3,686	569	547	401
Total	**1,904,101**	**25,208**	**176**	**6,802**	**781**	**755**	**630**

Source: BOEM (2021)

Table 3.4-5. Projected Operations and Maintenance Emissions (tons) for Carbon Dioxide and Regulated Pollutant for Projects in the Geographic Analysis Area from 2022 to 2030

Project	CO_2	NO_X	SO_2	CO	PM_{10}	$PM_{2.5}$	VOC
New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])	2,665	31	0.1	8	1	1	1
Sunrise, OCS-A 0487	64,145	590	1	246	11	11	14
South Fork, OCS-A 0517	18,894	281	2	58	10	10	6
New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])	7,705	76	0.2	19	3	2	1
Remaining Massachusetts/Rhode Island Lease Area	18,126	234	1	60	8	8	7
Total	**111,535**	**1,212**	**4**	**390**	**33**	**32**	**29**

Source: BOEM (2021)

3.4.2 Environmental Consequences

3.4.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

The Project design parameters that would influence the magnitude of impacts on air quality are listed in Table 3.4-6.

Table 3.4-6. Project Design Parameters

Design Parameter
Air emission ratings of construction equipment engines
Port selection and location of construction laydown areas
Choice of cable-laying locations and pathways
Choice of marine traffic routes to and from the Lease Area
Number of offshore substations
Soil characteristics at excavation sites
Emission control strategy for fugitive emissions due to excavation and hauling operations

Variability of the Project design as a result of the PDE includes the number of WTGs and their spacing within the Lease Area, spatial coverage of the overall Lease Area, and the construction schedule. A reduction (or increase) in the number of WTGs installed and their associated IACs would likely have an associated reduction (or increase) in associated vessel and equipment use and their generated air emissions. Additionally, variations in the planned cable layout and landfall locations would impact the magnitude and spatial extent of emissions. Appendix D provides additional information about the PDE.

See Appendix E1 for a summary of IPFs analyzed for air quality across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible effect are excluded from Chapter 3 and provided in Table E1-1 in Appendix E1. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4 to facilitate reader comparison across alternatives.

Table 3.4-7 discloses IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action follows the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action.

The conclusion section for each alternative analysis provides additional rationale for this impact determination. The overall impact of any alternative would be **moderate** adverse because the overall effects would be notable, but the resource would recover completely from adverse impacts without mitigation or remedial action.

Table 3.4-7. Alternative Comparison Summary for Air Quality

Impact-Producing Factor	Alternative A (No Action Alternative)	Alternative B (Proposed Action) Up to 100 WTGs*	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Air emissions and climate change	**Offshore:** During construction, impacts from future wind development activities on air quality would be temporary and **minor** to **moderate** adverse, depending on the extent and duration of emissions. Primary emission sources would include increased vessel and air traffic, combustion emissions from construction equipment, and fugitive emissions. Future offshore wind projects could also beneficially contribute to a broader combination of actions to reduce future impacts from climate change over the long term.	**Offshore:** Project construction would have a limited duration, and most emissions would occur offshore. The only air emissions anticipated during O&M would result from crew and maintenance vessels and helicopters. Therefore, impacts on air quality near populated areas would be temporary **minor** adverse. Project O&M would also generate long-term **minor** beneficial impacts by providing energy to the region from a renewable resource and due to avoided health events. The overall cumulative impacts associated with the Proposed Action when combined with other past, present, and reasonably foreseeable activities would be **moderate** adverse, although regional air quality could be improved over the Project lifecycle when compared to the No Action Alternative.	**Offshore:** When compared to the maximum case for the Proposed Action, construction under Alternatives C through F could result in a decrease in Project-related emissions due to less trenching and/or vessel traffic to install a reduced number of WTGs and their associated IACs. In such cases, emissions from construction and installation would be less than the Proposed Action but still temporary **minor** adverse. Alternatives C through F could also result in reduced O&M emissions because fewer WTGs installed, when compared to the maximum case under the Proposed Action, would mean potentially reduced inspection time, fewer turbines needing regular maintenance, etc. Alternatives C through F would avoid similar amounts of emissions as the minimum and maximum avoided emission values for the Proposed Action presented in Table 3.4-12. During O&M, Alternatives C through F would also result in long-term minor beneficial impacts on regional air quality by substituting some existing fossil fuel sources with a renewable source, which would contribute to a long-term net decrease in emissions in the region. Therefore, overall impacts on air quality under Alternatives C through F would likely be **minor** adverse and long term **minor** beneficial. Alternatives C through F would result in impacts on air quality at quantities and durations similar to, or slightly reduced from, the Proposed Action. Although regional air quality could be improved when compared to the No Action Alternative, it would be too remote or speculative to conclude what that change would be. Given the marginal reduction, however, the cumulative impacts of Alternatives C through F on air quality when combined with past, present, and reasonably foreseeable activities would remain **moderate** adverse.			
	Onshore: Ongoing activities and reasonably foreseeable activities other than offshore wind would result in **moderate** adverse impacts on air quality, primarily driven by recent market and permitting trends indicating future electric generating units would most likely include natural gas–fired and oil-fired dual fuel facilities, a mix of natural gas, and dual fuel natural gas/oil.	**Onshore:** Air emissions generated by construction and O&M of the onshore facilities could have temporary **negligible** to **minor** adverse impacts on air quality. When combined with other onshore sources of air emissions, cumulative impacts on air quality from onshore Project activities would be long term **minor** adverse.	**Onshore:** Alternatives C through F would not impact onshore activities; therefore, construction and O&M impacts would be the same as those described for the Proposed Action: temporary, **negligible** to **minor** adverse. Cumulative impacts would also be the same as those described for the Proposed Action: long term **minor** adverse.			

* If the Proposed Action were to select an 11–12 MW turbine, then the total number of WTGs installed and impacts from associated air emissions would be similar or the same as those under Alternatives C through F.

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3.4.2.2 Alternative B: Impacts of the Proposed Action on Air Quality

In their *Air Emissions Calculations and Methodology* technical report, Tech Environmental (2021) conservatively assumed that construction of the Project would only take 1 year. For estimating potential transit emissions, 11 regional ports that could be used during construction and O&M were considered (Table 3.4-8).

Table 3.4-8. Regional Ports Considered

Port Name	Location
Port of Providence	Providence County, Rhode Island
Port of Davisville at Quonset Point	Washington County, Rhode Island
Port of Galilee	Washington County, Rhode Island
Port of Montauk	Suffolk County, New York
Port Jefferson	Suffolk County, New York
Port of Brooklyn	Kings County, New York
Port of New London	New London County, Connecticut
Paulsboro Marine Terminal	Gloucester County, New Jersey
New Bedford Marine Commerce Terminal	Bristol County, Massachusetts
Port of Norfolk	Norfolk City, Virginia
Sparrow's Point	Baltimore County, Maryland

All ports except New York's Port of Montauk, Port Jefferson, and Port of Brooklyn were used for estimating construction emissions. The three ports in New York and the Ports of Davisville at Quonset Point and Galilee in Rhode Island were used for estimating O&M emissions.

It was conservatively assumed that when there were multiple port options for a particular Project phase involving regular transit, the port used for the emission calculations was the one with the longest transit distance. In the cases where multiple ports were listed as potential ports for vessel activities, the emissions were conservatively allocated to all potential ports. This approach provides a very conservative estimate of potential emissions for each state.

O_3 emissions are not included in the air quality impact analyses presented herein. O_3 emissions cannot be easily quantified since O_3 formation is a byproduct of chemical reactions between VOC and NO_X caused by heat and sunlight and thus emissions of O_3 depend on local weather conditions.

3.4.2.2.1 Construction and Installation

Offshore Activities and Facilities

Air emissions and climate change: Table 3.4-9 presents a summary of the Project's estimated offshore construction emissions emitted during a maximum-case scenario in which all construction activities would occur in a single year. Construction emissions occurring within 15.5 miles of on-land construction areas and port locations are compared to the emission inventories of the impacted counties.

Over the approximate 1-year construction period, Project air emissions from vessels, helicopters, generators, and fuel-burning equipment could have temporary, direct impacts on air quality. Estimated emissions for most pollutants occurring within 15.5 miles of on-land construction areas and port locations would represent a 16.0% or less temporary increase in air pollutants for counties within the GAA. NO_X construction emissions are more substantial in comparison to the counties' NO_X emissions (in the range of 2%–45%). However, these emissions would be temporary and could be reduced by implementing proposed EPMs (see Table F-1 in Appendix F). Furthermore, this is a conservative analysis of the impact of the construction emissions occurring within 15.5 miles of on-land construction areas and port locations because it assumes all of the emissions would directly affect the nearest county's air. Emissions occurring outside the OCS permit area within 15.5 miles of on-land construction areas and port locations would primarily result from transit vessels used to transport equipment and material. Vessel engines are required to meet certain emission standards and must use low-sulfur diesel fuel. Realistically, vessel transit emissions would be spread out over the transport route. Depending on wind conditions at the time of emissions, it is likely that not all emissions generated miles offshore would reach land. Therefore, Project construction activities would have a temporary **minor** adverse impact on New London, Gloucester, Baltimore, Providence, Washington, Bristol, and Norfolk City Counties' air quality.

Construction emissions occurring offshore in the OCS permit area are not compared to county emission inventories because only a portion of the generated construction emissions would actually reach nearby counties and would depend on wind conditions at the time the emissions are generated. The OCS air permitting process will require air dispersion modeling of these emissions to demonstrate compliance with the NAAQS. If the Project cannot demonstrate compliance, the permit would not be issued, and the Project would not proceed.

The emission totals presented in the analysis represent a worst-case construction scenario in which all construction activities would occur in a single year. Project construction would also have a limited duration, and most emissions would occur offshore. The emissions quantified in Table 3.4-9 would not be emitted entirely at a single point or port and would not continuously affect nearby populated areas. Therefore, impacts on air quality near populated areas would be temporary **minor** adverse.

Table 3.4-9. Summary of Geographic Analysis Area Offshore Construction Emissions (tpy)

Source	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Construction Emissions within 15.5 Miles of Potential Project On-Land Construction Areas and Port Locations							
RWF-Connecticut	22.3	101.6	3.4	3.3	0.1	3.6	14,980
Percentage of New London County, Connecticut, emission inventory	0.09%	1.92%	0.12%	0.31%	0.03%	0.02%	0.76%
RWF-New Jersey	674.8	2,796.2	94.5	91.2	8.4	49.5	190,927
Percentage of Gloucester County, New Jersey, emission inventory	2.22%	44.66%	4.37%	6.95%	1.40%	0.47%	2.91%
RWF-Maryland	533.4	2,210.3	74.7	72.1	6.6	39.1	150,923
Percentage of Baltimore County, Maryland, emission inventory	0.74%	20.73%	0.61%	2.25%	0.63%	0.23%	3.03%
RWF-Rhode Island	169.5	711.7	24.1	23.3	2.2	14.8	56,604
RWEC-Rhode Island	19.0	78.2	2.6	2.5	0.3	1.4	5,216
Total Rhode Island	**188.5**	**789.9**	**26.7**	**25.8**	**2.5**	**16.2**	**61,820**
Percentage of Providence County, Rhode Island, emission inventory	0.40%	10.12%	0.59%	1.33%	0.53%	0.10%	1.22%
Percentage of Washington County, Rhode Island, emission inventory	1.30%	30.71%	2.28%	4.34%	2.40%	0.22%	9.63%
RWF-Massachusetts	175.4	734.6	24.9	24.0	2.1	14.9	58,274
Percentage of Bristol County, Massachusetts, emission inventory	0.35%	8.26%	0.69%	1.28%	0.24%	0.09%	1.35%
RWF-Virginia	613.5	2,551.6	86.2	83.2	7.5	47.0	182,269
Percentage of Norfolk City, Virginia, emission inventory	2.47%	41.85%	5.72%	12.09%	3.24%	0.80%	16.32%
RWF-maximum potential federal water	2,105.5	8,745.7	293.9	283.9	25.1	153.0	595,830

Source	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Outer Continental Shelf Permit Area Construction Emissions							
RWF	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total OCS Permit Area Construction Emissions	**1,007.6**	**4,124.1**	**134.5**	**130.0**	**13.2**	**85.4**	**282,268**

Source: Tech Environmental (2021)

Notes:

RWF-Connecticut = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of New London.

RWF-New Jersey = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Paulsboro Marine Terminal.

RWF-Rhode Island = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of Providence and the Port of Davisville at Quonset Point.

RWEC-Rhode Island = the portion of RWEC offshore segment construction emissions that would occur outside the OCS permit area and within 15.5 miles of shore.

RWF-Maryland = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from Sparrow’s Point.

RWF-Massachusetts = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the New Bedford Marine Commerce Terminal and during transit to and from European ports.

RWF-Virginia = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of Norfolk and during transit to Sparrow’s Point.

RWEC-OCS = the portion of RWEC offshore segment construction emissions that would occur within the OCS permit area.

Onshore Activities and Facilities

Air emissions and climate change: Table 3.4-10 presents the estimated onshore construction emissions for the Project. The onshore facilities, inclusive of the landfall work area, onshore transmission cable, OnSS, and ICF (including associated interconnection circuits and Project easement), would be constructed in Davisville, Washington County, Rhode Island, which is in attainment for all pollutants.

Table 3.4-10. Summary of Emissions from Onshore Facilities Construction (tpy)

Source	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
OnSS and ICF	367.5	382.0	14.6	13.8	1.3	26.8	164,525
Onshore transmission cable	8.9	37.2	1.8	1.8	0.1	2.4	7,342
Horizontal directional drilling in the landfall work area	4.3	14.3	0.7	0.7	0.0	1.0	3,271
Total	**380.7**	**433.5**	**17.1**	**16.3**	**1.4**	**30.2**	**175,138**
Percentage of Kent County, Rhode Island, emission inventory	2.31%	20.26%	1.72%	2.94%	1.18%	0.53%	21.38%
Percentage of Providence County, Rhode Island, emission inventory	0.82%	5.55%	0.38%	0.84%	0.29%	0.18%	3.44%
Percentage of Washington County, Rhode Island, emission inventory	2.62%	16.85%	1.46%	2.74%	1.34%	0.40%	27.28%

Source: Tech Environmental (2021)

Construction of the onshore facilities is estimated to take 18 months, but the air technical report analysis conducted by Tech Environmental (2021) presumes that construction could occur as quickly as 1 year. Construction of the onshore facilities would involve emissions from on-road and non-road equipment, which could have temporary, direct impacts on air quality. The Port of Davisville at Quonset Point would be used for construction support activities. The estimated onshore facilities construction emissions for regulated pollutants were compared to county emission inventories for the counties within 15.5 miles of the Port of Davisville at Quonset Point (the GAA). The Proposed Action onshore facility construction NO_X emissions would be approximately 5.5% of Providence County, Rhode Island's annual NO_X emissions, 16.9% of Washington County, Rhode Island's annual NO_X emissions, and 20.3% of Kent County, Rhode Island's annual NO_X emissions. Most emissions of regulated pollutants were between 0.29% and 2.94% of Kent, Providence, or Washington Counties' annual emissions. Air emissions generated by constructing the onshore facilities could have temporary **minor** adverse impacts on air quality.

3.4.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Air emissions and climate change: Emissions from the Project O&M would be much lower than those produced during construction because there would be no direct emissions associated with wind turbine operation. The only air emissions anticipated during O&M would result from crew and maintenance vessels and helicopters. Planned maintenance activities include annual turbine service and safety surveys, annual oil and lubricant changes, annual inspections of turbines and foundations, seafloor and submarine surveys, biannual electrical inspections, regular electrical component servicing, annual scheduled maintenance, and all major and minor corrective maintenance. Table 3.4-11 summarizes the Project O&M emissions estimated for the air quality GAA. Project O&M emissions occurring within 15.5 miles of on-land construction areas and port locations are compared to the emission inventories of the impacted counties. These O&M emissions occurring within 15.5 miles of on-land construction areas and port locations would increase the annual emissions of each pollutant by 1.5% or less for all counties within the GAA.

Project O&M emissions occurring offshore in the OCS permit area are not compared to county emission inventories because only a portion of these emissions would actually reach nearby counties, depending on wind conditions at the time of emission. The OCS air permitting process will require air dispersion modeling of these emissions to demonstrate compliance with the NAAQS. Therefore, Project O&M activities would have a **minor** adverse impact on the air quality in the counties in the GAA.

Project O&M would also generate long-term **minor** beneficial impacts by providing energy to the region from a renewable resource. Currently, the region in which this wind farm would serve obtains between 40% and 51% of its power through the combustion of natural gas (U.S. Energy Information Administration 2021). By replacing a portion of the air pollutant emissions generated by fossil fuel–fired power plants, significant reductions in air pollutants emissions can be achieved. A recent study of current wind projects found that there is a net reduction in emissions within 6 months of the commencement of operations (Inderscience Publishers 2014). Furthermore, as transportation and heating become increasingly electrified, the demand for electrical power will grow. Without offshore wind, states would not be able to meet their emission targets and meet this increasing demand.

Table 3.4-11. Summary of Offshore Operations and Maintenance Emissions (tpy)

Source	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Operations and Maintenance Emissions within 15.5 Miles of Potential Project On-Land Areas and Port Locations							
RWF-New York	51.2	205.3	6.9	6.7	0.1	3.0	14,506
Percentage of Kings County, New York, emission inventory	0.09%	1.51%	0.14%	0.26%	0.02%	0.02%	0.28%
Percentage of Suffolk County, New York, emission inventory	0.03%	1.01%	0.07%	0.17%	0.01%	0.01%	0.14%
RWF-Rhode Island	3.3	13.0	0.4	0.4	0.0	0.3	1,001
Percentage of Washington County, Rhode Island, emission inventory	0.02%	0.51%	0.03%	0.07%	0.00%	0.00%	0.16%
Outer Continental Shelf Permit Area Emissions							
RWF	207.6	847.7	27.4	26.6	0.6	12.4	57,820

Source: Tech Environmental (2021)

Notes:

RWF-New York = the portion of RWF O&M emissions that would occur outside the OCS permit area and within 15.5 miles from shore during transit to and from the Port of Montauk, Port Jefferson, and the Port of Brooklyn.

RWF-Rhode Island = the portion of RWF O&M emissions that would occur beyond the OCS permit area and within 15.5 miles from shore during transit to and from the Port of Providence and the Port of Davisville at Quonset Point.

In the case of decommissioning, emissions would result largely from the operation of decommissioning equipment and vessels or aircraft. Associated air emissions would occur 35 years in the future when air quality conditions, emissions technology, and regulations would be different; therefore, estimating decommissioning emission impacts now is speculative. Because portions of the Project would be decommissioned in place, fewer decommissioning activities and less equipment would be required; therefore emissions from decommissioning activities would be less than those from construction activities. The decommissioning activities would be subject to a future OCS air permit, or similar, application. There would be no further air emissions from RWF once decommissioning is complete.

The use of wind to generate electricity reduces the need for electricity generation from new traditional fossil fuel–powered plants in New England that produce GHG emissions. BOEM obtained avoided emissions from EPA's AVERT Excel Edition, Version 3.1.1 for the New England region based on EPA's 2019 regional data file. Regional data for 2020 is available, but due to the temporary declines in electricity demands, particularly from March through May 2020 likely caused by the pandemic, the EPA recommends using the 2019 regional data file when assessing annual, near-term future avoided emissions. The EPA's AVERT is not a long-term projection tool. It is not intended to analyze avoided emissions more than 5 years from baseline. The estimated annual and 5-year long-term total avoided emissions are based on minimum and maximum design capacity of the Project (704 MW and 880 MW, respectively). To provide a rough estimate of the long-term avoided emissions of the Project, the maximum and minimum annual avoided emissions estimated by AVERT were multiplied by 5 years. As presented in Table 3.4-12, the Project would annually displace CO_2, NO_X, SO_2, $PM_{2.5}$, VOC, and ammonia (NH_3) produced by the New York electric grid and decrease the creation of air pollutant emissions in the atmosphere from traditional fossil fuel–fired power plants.

Table 3.4-12. Estimated Annual and 5-Year Avoided Emissions for the Operation of the Revolution Wind Farm (tons)

Term	CO_2	NO_X	SO_2	$PM_{2.5}$	VOC	NH_3
Maximum annual avoided emissions	1,771,440	292.01	126.06	50.89	33.07	45.98
Minimum annual avoided emissions	1,415,690	234.75	102.57	40.78	26.43	36.77
Maximum 5-year avoided emissions	8,857,200	1,460.03	630.28	254.43	165.35	229.88
Minimum 5-year avoided emissions	7,078,450	1,173.75	512.83	203.88	132.13	183.85

Source: EPA (2020b)

The EPA's CO-Benefits Risk Assessment (COBRA) screening model Desktop Edition, Version 4.1 was used to estimate the health impacts of avoided emissions in the United States and in the combined area of Connecticut, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Virginia. The model used the following inputs: 2023 was selected as the analysis year to estimate the health impacts of emissions changes. New York was selected as the state where the emission changes would occur; Fuel Combustion: Electric Utility was the sector where the emission changes would occur; and the AVERT output file for the minimum annual avoided emissions for NO_X, SO_2, $PM_{2.5}$, VOC, and NH_3, as noted in

Table 3.4-12 was loaded into the COBRA application. The model provides estimated ranges of reduced occurrences of health events caused by air pollution, such as mortality, nonfatal heart attacks, and hospitalizations. It also estimates the total health benefit, which encompasses all saved costs of the avoided health events. COBRA includes a discount rate of either 3%, to account for the interest that may be earned from government backed securities, or 7%, to account for private capital opportunity costs. Monetary values presented are in 2017 dollars. The EPA recommends using both for a bounding approach. For the entire United States, COBRA estimates that the total health benefit ranges from $12,096,077 to $27,290,022 at a 3% discount rate and from $10,793,564 to $24,334,469 at a 7% discount rate. COBRA estimates statistical lives saved within the entire United States to range from 1.09 to 2.46 (EPA 2020c). For Connecticut, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Virginia, combined, COBRA estimates that the total health benefit ranges from $9,891,082 to $22,309,940 at a 3% discount rate and from $8,826,280 to $19,893,704 at a 7% discount rate. COBRA estimates statistical lives saved within Connecticut, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Virginia, combined, to range from 0.89 to 2.01 (EPA 2020c). For a 5-year estimate for the United States, the total health benefit ranges from $60,480,383 to $136,450,108 at a 3% discount rate and from $53,967,819 to $121,672,344 at a 7% discount rate. Over the course of 5 years, the statistical lives saved within the entire United States is between 5.44 and 12.31. This 5-year estimate is representative of the avoided emissions during operations only. This would represent a long-term **minor** beneficial impact due to avoided health events.

Onshore Activities and Facilities

Air emissions and climate change: Onshore O&M activities would include periodic inspections, preventative maintenance, and regular equipment servicing. Table 3.4-13 presents the estimated onshore facilities O&M emissions for the Project. Annual O&M emissions from onshore facilities range from < 0.01% to 0.01% of Kent, Providence, and Washington Counties' annual emissions. Impacts on air quality from Project onshore facilities' O&M emissions would be **negligible** adverse.

Table 3.4-13. Summary of Emissions from Onshore Facilities Operations and Maintenance (tpy)

Source, State	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Onshore facilities, Rhode Island	0.6	0.2	0.0	0.0	0.0	0.0	22
Total	**0.6**	**0.2**	**0.0**	**0.0**	**0.0**	**0.0**	**22**
Percentage of Kent County, Rhode Island, emission inventory	< 0.01%	0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%
Percentage of Providence County, Rhode Island, emission inventory	< 0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%
Percentage of Washington County, Rhode Island, emission inventory	< 0.01%	0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%	< 0.01%

Source: Tech Environmental (2021)

Decommissioning activities associated with the onshore facilities would not likely impact air quality in the region. Associated air emissions would occur 35 years in the future when air quality conditions, emissions technology, and regulations would be different; therefore, estimating decommissioning emission impacts now is speculative. Because portions of the Project would be decommissioned in place, fewer decommissioning activities and less equipment would be required; therefore emissions, from decommissioning activities would be less than those from construction activities. There would be no further air emissions from RWF once decommissioning is complete.

3.4.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Air emissions and climate change: Construction and installation, O&M, and decommissioning emissions associated with the Proposed Action would result in temporary moderate adverse, long-term minor adverse, and long-term minor beneficial impacts on air quality. The Proposed Action's construction emissions (see Tables 3.4-9 and 3.4-10) would noticeably increase emissions of regulated pollutants over the construction emissions generated by other offshore wind projects associated with the No Action Alternative (see Table 3.4-4). Therefore, total cumulative construction-related air emissions from all planned offshore wind energy projects, including the Proposed Action, in the OCS air permit area would consist of an estimated 29,333 tons of NO_X, 189 tons of SO_2, 915 tons of PM_{10}, and 2,186,369 tons of CO_2. However, these effects would be localized and would cease when Project construction is complete.

Table 3.4-14 combines the total estimated construction emissions contributed by the Proposed Action within the OCS air permit area with the estimated local construction emissions that occur beyond the OCS air permit area and within 15.5 miles of shore (RWF-New Jersey, RWF-Massachusetts, RWEC-Rhode Island, etc.). The totals are not compared to county emission inventories because only portions of the Proposed Action construction emissions generated offshore within the OCS air permit area would reach nearby counties, depending on wind conditions at the time of emission. The OCS air permitting process will require air dispersion modeling of these emissions to demonstrate compliance with the NAAQS.

Table 3.4-14. Geographic Analysis Area Offshore Cumulative Construction Emissions (tpy)

Source, State	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Connecticut							
RWF-Connecticut	22.3	101.6	3.4	3.3	0.1	3.6	14,980
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total Connecticut Emissions	**1,029.9**	**4,225.7**	**137.9**	**133.3**	**13.3**	**89.0**	**297,248**
New Jersey							
RWF-New Jersey	674.8	2,796.2	94.5	91.2	8.4	49.5	190,927
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total New Jersey Emissions	**1,682.4**	**6,920.3**	**229.0**	**221.2**	**21.6**	**134.9**	**473,195**
Maryland							
RWF-Maryland	533.4	2,210.3	74.7	72.1	6.6	39.1	150,923
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total Maryland Emissions	**1,541.0**	**6,334.4**	**209.2**	**202.1**	**19.8**	**124.5**	**433,191**
Rhode Island							
RWF-Rhode Island	169.5	711.7	24.1	23.3	2.2	14.8	56,604
RWEC-Rhode Island	19.0	78.2	2.6	2.5	0.3	1.4	5,216
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total Rhode Island Emissions	**1,196.1**	**4,914.0**	**161.2**	**155.8**	**15.7**	**101.6**	**344,088**

Source, State	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
Massachusetts							
RWF-Massachusetts	175.4	734.6	24.9	24.0	2.1	14.9	58,274
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total Massachusetts Emissions	**1,183.0**	**4,858.7**	**159.4**	**154.0**	**15.3**	**100.3**	**340,542**
Virginia							
RWF-Virginia	613.5	2,551.6	86.2	83.2	7.5	47.0	182,269
RWF-OCS	941.9	3,854.1	125.5	121.3	12.3	80.6	264,307
RWEC-OCS	65.7	270.0	9.0	8.7	0.9	4.8	17,961
Total Virginia Emissions	**1,621.1**	**6,675.7**	**220.7**	**213.2**	**20.7**	**132.4**	**464,537**

Source: Tech Environmental (2021)

Notes:

RWF-Connecticut = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of New London.

RWF-New Jersey = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Paulsboro Marine Terminal.

RWF-Rhode Island = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of Providence and the Port of Davisville at Quonset Point.

RWEC-Rhode Island = the portion of RWEC offshore segment construction emissions that would occur outside the OCS permit area and within 15.5 miles of shore.

RWF-Maryland = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from Sparrow's Point.

RWF-Massachusetts = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the New Bedford Marine Commerce Terminal and during transit to and from European ports.

RWF-Virginia = the portion of RWF construction emissions that would occur beyond the OCS permit area and within 15.5 miles of shore during transit to and from the Port of Norfolk and during transit to Sparrow's Point.

RWEC-OCS = the portion of RWEC offshore segment construction emissions that would occur within the OCS permit area.

RWF-OCS = the portion of RWF construction emissions that occur within the OCS permit area.

Air quality impacts from O&M of the Proposed Action, provided in Tables 3.4-11 and 3.4-13, would combine with the air quality impacts from all other O&M activities that could occur under the No Action Alternative (see Table 3.4-7), albeit at lower emission quantities compared to the construction and installation period. O&M emissions would noticeably add emissions in localized areas, several times per year, for the life of the Project. Total cumulative operation-related air emissions from all of the planned wind projects, including the Proposed Action, in the OCS air permit area would consist of an estimated 2,060 tons of NO_X, 5 tons of SO_2, 60 tons of PM_{10}, and 168,623 tons of CO_2.

If annual O&M emissions emitted by the Proposed Action within the OCS air permit area are combined with the estimated annual O&M emissions emitted by the Proposed Action within 15.5 miles of the on-land areas and port locations in New York (RWF – New York), and if this summed, conservative total is compared to the 2017 National Emission Inventory for Kings and Suffolk Counties, New York, Kings County would see a 0.2% to 7.8% increase (depending on the pollutant) in its regulated pollutant annual emissions, whereas Suffolk County would see a 0.06% to 5.2% increase in its regulated pollutant annual emissions. Similarly, if the total annual O&M emissions emitted by the Proposed Action within the OCS air permit area are combined with the estimated annual O&M emissions emitted by the Proposed Action within 15.5 miles of the on-land areas and port locations in Rhode Island (RWF – Rhode Island), and if this summed, conservative total is compared to Washington County, Rhode Island's 2017 National Emission Inventory, there would be a 0.6% to 33.5% increase in its regulated pollutant annual emissions. These are very conservative estimated increases because not all of the annual O&M emissions generated within the OCS air permit area would impact each nearby county in turn. Instead, only a portion of emissions generated within the OCS air permit area would actually reach land, depending on wind conditions at the time of emission.

Table 3.4-15. Geographic Analysis Area Offshore Cumulative Operations and Maintenance Emissions (tpy)

Source, State	CO	NO_X	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_2e
New York							
RWF-New York	51.2	205.3	6.9	6.7	0.1	3.0	14,506
RWF-OCS	207.6	847.7	27.4	26.6	0.6	12.4	57,820
Total New York Emissions	**258.8**	**1,053.0**	**34.3**	**33.3**	**0.7**	**15.4**	**72,326**
Percentage of Kings County, New York, emission inventory	0.44%	7.76%	0.69%	1.30%	0.15%	0.09%	1.41%
Percentage of Suffolk County, New York, emission inventory	0.18%	5.18%	0.35%	0.86%	0.06%	0.05%	0.69%
Rhode Island							
RWF-Rhode Island	3.3	13.0	0.4	0.4	0.0	0.3	1,001
RWF-OCS	207.6	847.7	27.4	26.6	0.6	12.4	57,820
Total Rhode Island Emissions	**210.9**	**860.7**	**27.8**	**27.0**	**0.6**	**12.7**	**58,821**
Percentage of Washington County, Rhode Island, emission inventory	1.45%	33.46%	2.37%	4.55%	0.58%	0.17%	9.16%

Source: Tech Environmental (2021)

Notes:

RWF-New York = the portion of RWF O&M emissions that would occur outside the OCS permit area and within 15.5 miles from shore during transit to and from the Port of Montauk, Port Jefferson, and the Port of Brooklyn.

RWF-Rhode Island = the portion of RWF O&M emissions that would occur beyond the OCS permit area and within 15.5 miles from shore during transit to and from the Port of Providence and the Port of Davisville at Quonset Point.

RWF-OCS = the portion of RWF construction emissions that occur within the OCS permit area.

The Proposed Action would also have a noticeable contribution on existing GHG emissions. The construction and installation, O&M, and the eventual decommissioning of the Proposed Action would generate approximately 515,248 metric tons more CO_2e emissions over the No Action Alternative within the OCS air permit area. However, these contributions are small in proportion to aggregate national and global emissions. In 2019, U.S. GHG emissions totaled 6,558 million metric tons of CO_2e (EPA 2021c).

While cumulative air emissions in the region would increase during construction, the Project could also contribute to a long-term, cumulative net decrease in emissions by substituting some existing fossil fuel sources with a renewable source. As presented in Table 3.4-12, the Proposed Action would avoid an estimated minimum of 235 tons of NO_X, 103 tons of SO_2, 41 tons of $PM_{2.5}$, 26 tons of VOC, 37 tons of NH_3, and 1,415,690 tons of CO_2 every year and would avoid an estimated maximum of 292 tons of NO_X, 126 tons of SO_2, 51 tons of $PM_{2.5}$, 33 tons of VOC, 46 tons of NH_3, and 1,771,440 tons of CO_2 every year by providing energy generation that existing fossil fuel–generated energy sources would have otherwise provided (EPA 2020b). This represents up to an estimated 5.3% to 6.2% increase in avoided emissions over the No Action Alternative on an annual basis. When combined with estimated avoided emissions under the No Action Alternative (see Table 3.4-3), offshore wind projects could cumulatively avoid an estimated minimum of 4,149 tons of NO_X, 1,759 tons of SO_2, 724 tons of $PM_{2.5}$, 471 tons of VOC, 653 tons of NH_3, and 25,266,226 tons of CO_2 every year and would avoid an estimated maximum of 5,772 tons of NO_X, 2,440 tons of SO_2, 1,008 tons of $PM_{2.5}$, 655 tons of VOC, 909 tons of NH_3, and 35,186,254 tons of CO_2 every year.

Based on the above considerations, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action when combined with other past, present, and reasonably foreseeable activities would be **moderate** adverse, although regional air quality could be improved over the Project lifecycle when compared to the No Action Alternative.

Onshore Activities and Facilities

<u>Air emissions and climate change</u>: Project onshore facilities would result in temporary to long-term negligible to minor adverse air emissions as a result of on-road and non-road equipment use. The Proposed Action onshore facility construction NO_X emissions are approximately 5.5% of Providence County, Rhode Island's annual NO_X emissions, 16.9% of Washington County, Rhode Island's annual NO_X emissions and 20.3% of Kent County, Rhode Island's annual NO_X emissions.

Most O&M annual emissions of regulated pollutants were between 0.29% and 2.94% of Kent, Providence, or Washington Counties' annual emissions. Annual O&M emissions from onshore facilities would have a negligible adverse impact, ranging from < 0.01% to 0.01% of Kent, Providence, and Washington Counties' annual emissions. When combined with other onshore sources of air emissions, cumulative impacts on air quality would be long term **minor** adverse.

3.4.2.2.4 Conclusions

Construction and installation and decommissioning activities would cause increased air emissions temporarily. Emission sources from O&M activities would primarily use vehicles and vessels that emit less emissions than during construction and installation and decommissioning activities, and fewer annual trips would be needed. Therefore, BOEM expects the impact on air quality from the Proposed Action alone to be **minor** adverse due to air emissions from construction activities. While cumulative air emissions in the region would increase during construction, it is important to note that the Proposed Action could also contribute to a long-term net decrease in emissions by substituting some existing fossil fuel sources with a renewable source. By substituting some fossil fuel sources with a renewable source with less emissions, the Proposed Action would generate long-term **minor** beneficial impacts to regional air quality by contributing to a long-term net decrease in emissions in the region.

Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action when combined with other past, present, and reasonably foreseeable activities would remain **moderate** adverse, although regional air quality could be improved when compared to the No Action Alternative.

3.4.2.3 Alternatives C, D, E, and F

Table 3.4-7 provides a summary of IPF findings for these alternatives.

3.4.2.3.1 Conclusions

Although Alternatives C through F would reduce the number of allowable WTGs and their associated IACs, which would likely have an associated reduction in associated vessel and equipment use and air emissions, BOEM expects the impacts from each alternative would be similar to the Proposed Action: **minor** adverse due to air emissions from construction activities. Project O&M would also contribute to long-term **minor** beneficial impacts by substituting some fossil fuel sources of electricity generation with a lower emitting renewable source and thus, would result in a net reduction in cumulative air emissions in the region.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that each alternative's impacts would be similar to the Proposed Action (with individual IPFs leading to impact that would be short term **minor** adverse and long term **minor** beneficial). The overall cumulative impacts of each alternative on air quality when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **moderate** adverse, with potential regional improvements to air quality when compared to the No Action Alternative. Overall adverse effects would be notable, but the resource would recover completely from adverse impacts.

3.4.2.4 Mitigation

No potential additional mitigation measures for air quality are identified in Table F-2 in Appendix F.

3.5 Bats

3.5.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Bats

Geographic analysis area: Although historic anecdotal observations of bats up to 1,212 miles (1,950 km) offshore North America exist, recent offshore observations of tree bats range from 10.5 to 26.0 miles (16.9 to 41.8 km) (Hatch et al. 2013). For this reason, and to capture most of the movement range for migratory bat species, the GAA for bats consists of the United States coastline from Maine to Florida and extends 100 miles (160.9 km) offshore and 5 miles (8.05 km) inland to capture the movement range for species in this group (Figure 3.5-1).

Northern long-eared bats (*Myotis septentrionalis*) and other cave bats typically do not occur on the OCS. Tree bats are long-distance migrants; their range includes most of the Atlantic coast from Florida to Maine. Although these species have been documented on the open ocean and could encounter WTGs, use of offshore habitat is thought to be limited and generally restricted to spring and fall migration. The onshore limit of the GAA is 0.5 mile (0.8 km) inland to cover onshore habitats used by the bat species that may be affected by offshore components of the proposed Project as well as those species that could be affected by proposed onshore Project components. The onshore limit of the GAA is intended to cover most of the onshore habitat used by those bat species that may encounter the Project during most of their life cycles.

Affected environment: This section provides information on existing bat species and habitat trends from past and present activities. Bats within the GAA are subject to pressure from ongoing activities 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 result in impacts on bat species. The Vineyard Wind Final EIS (BOEM 2021a), the South Fork Wind Farm (SFWF) Final EIS (BOEM 2021b), and COP Appendix AA (Biodiversity Research Institute [bri] 2021) provide detailed discussions of existing bat resources as well as bat species and habitat trends along the East Coast, which are incorporated by reference. Appendix E1 of this EIS provides additional information regarding past and present activities and associated impacts to bats.

Eight bat species are present in the state of Rhode Island, five of which are likely year-round residents. Bat species that may occur in the offshore and onshore portions of the Lease Area are the long-distance migrants and the non-migrating cave-dwelling bats. Long-distance migrants consist of hoary bat (*Lasiurus cinereus*), eastern red bat (*Lasiurus borealis*), and silver-haired bat (*Lasionycteris noctivagans*). Non-migratory cave dwellers consist of northern long-eared bat, little brown bat (*Myotis lucifugus*), eastern small-footed bat (*Myotis leibii*), big brown bat (*Eptesicus fuscus*), and tri-colored bat (*Perimyotis subflavus*) (see Table 2-3 in COP Appendix AA [bri 2021]). Both groups of bats are nocturnal insectivores that use a variety of forested and open habitats for foraging during the summer (Barbour and Davis 1969). Cave-hibernating bats are generally not observed offshore (Dowling and O'Dell 2018) and in winter migrate from summer habitat to hibernacula in the region (Maslo and Leu 2013). Migratory tree bats fly to southern parts of the United States in the winter and have been observed offshore during migration (Hatch et al. 2013; Stantec Consulting Services Inc. [Stantec] 2016, 2018).

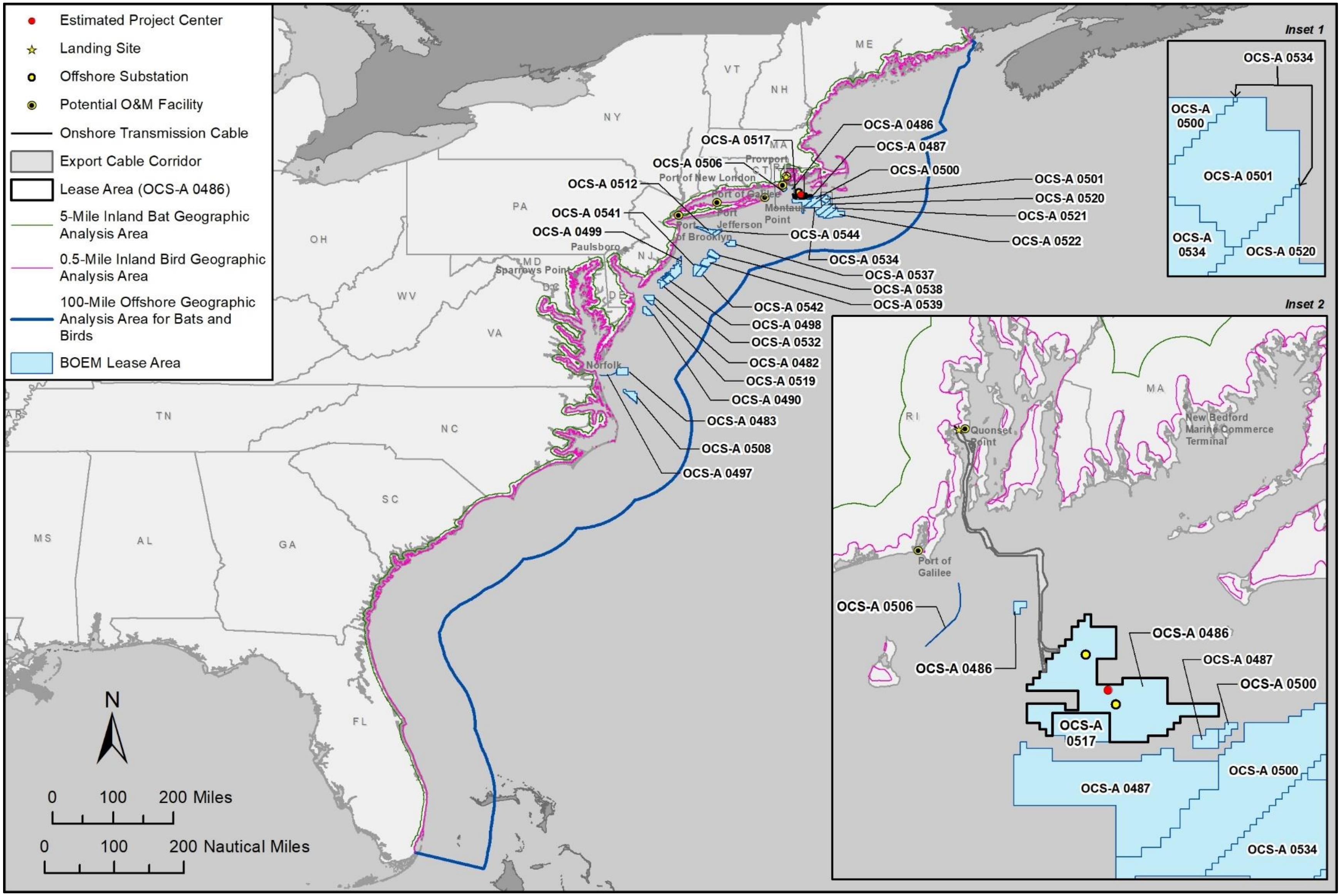

Figure 3.5-1. Geographic analysis area for bats.

Offshore

Although there is uncertainty on the specific movements of bats offshore, bats have been documented using the marine environment in the United States (Cryan and Brown 2007; Dowling and O’Dell 2018; Grady and Olson 2006; Hatch et al. 2013; Johnson et al. 2011; Stantec 2016). Bats have been observed to temporarily roost on structures, such as lighthouses on nearshore islands (Dowling et al. 2017). There is also historical evidence of bats, particularly eastern red bats, migrating offshore in the Atlantic (Hatch et al. 2013). In a mid-Atlantic bat acoustic study conducted during the spring and fall of 2009 and 2010 (86 nights), the maximum distance that bats were detected from shore was 13.6 miles (21.9 km), and the mean distance was 5.2 miles (8.4 km) (Sjollema et al. 2014). In Maine, bats were detected on islands up to 25.8 miles (41.6 km) from the mainland (Peterson et al. 2014). In the mid-Atlantic acoustic study (Sjollema et al. 2014), eastern red bats made up 78% (166 bat detections during 898 monitoring hours) of all bat detections offshore. This study also found that bat activity decreased as wind increased (Sjollema et al. 2014). In addition, eastern red bats were detected in the mid-Atlantic up to 27.3 miles (44 km) offshore, outside the vicinity of islands or other structures, by high-resolution video aerial surveys (Hatch et al. 2013). Shipboard acoustic surveys conducted by Stantec in 2017 detected over 900 bat passes (primarily long-distance migratory tree bats) within the adjacent proposed SFWF Lease Area, export cable route, and adjacent offshore and coastal areas. Eastern red bats accounted for 69% of calls detected, whereas silver-haired bats accounted for 13%. All other species accounted for less than 5% of calls that were identified to species level. Peak detections for all species occurred during the month of August, suggesting that most offshore movement is associated with fall migration (Stantec 2018).

Several studies highlight the relationship between bat activity and weather conditions. Acoustic monitoring within the footprint of the proposed SFWF in southern New England found 82% of recorded bat passes with corresponding weather data occurred when wind speeds were < 5.0 meters/second (m/s) and temperatures were ≥ 15.0°C (Stantec 2018). This occurred during 49% of nighttime hourly rounded weather data increments during the monitoring period from July 14 to November 15. These weather conditions most often occurred from August through September. Bat activity occurred primarily during nights with warmer temperatures and low wind speeds, which has been likewise documented in several other studies (Fiedler 2004; Reynolds 2006; Stantec 2016). Similar monitoring at the operational Block Island Wind Farm in Rhode Island found that 90% of bat passes occurred at times when wind speeds were below 5.0 m/s and temperatures were at or above 15.0°C (Stantec 2018). Both studies reported very little activity at temperatures below 15.0°C, and most activity was documented at wind speeds between 2 and 4 m/s. Smith and McWilliams (2016) developed predictive models of regional nightly bat activity using continuous acoustic monitoring at several locations in coastal Rhode Island. Bat activity was found to steadily decrease with decreasing temperatures, and departures from seasonally normal temperatures increasingly inhibited bat activity later in the season (September through October). This study found no association between wind speed and bat activity, which contrasts with most other literature that shows bat activity is associated with relatively low wind speeds (Arnett et al. 2008; Cryan and Brown 2007; Fiedler 2004; Kerns et al. 2005), although wind speed data were regional and not site specific.

Cave-hibernating bats hibernate regionally in caves, mines, and other structures and primarily feed on insects in terrestrial and freshwater habitats. These species generally exhibit lower activity in the offshore environment than migratory tree bats (Sjollema et al. 2014), with movements primarily occurring during the fall. In the region, the maximum distance *Myotis* bats were detected offshore was 7.2 miles (11.5 km) (Sjollema et al. 2014). A recent nanotag tracking study on Martha’s Vineyard recorded little brown bat (n = 3) movements off the island in late August and early September, with one individual flying from Martha's Vineyard to Cape Cod (Dowling et al. 2017). Big brown bats (n = 2) were also detected migrating from the island later in the year (October–November) (Dowling et al. 2017). These findings are supported by an acoustic study conducted on islands and buoys in the Gulf of Maine that indicated the greatest percentage of activity in July–October (Peterson et al. 2014). Presence in the Lease Area is considered rare for this group given the use of the coastline as a migratory pathway by cave-hibernating bats is likely limited to their fall migration period; acoustic studies indicate lower use of the offshore environment by cave-hibernating bats; and cave-hibernating bats do not regularly feed on insects over the ocean (bri 2021).

Tree bats migrate south to overwinter and have been documented in the GAA's offshore environment (Hatch et al. 2013; Stantec 2018, 2019). Eastern red bats have been detected migrating from Martha's Vineyard late in the fall, with one individual tracked as far south as Maryland (Dowling et al. 2017). These results are supported by historical observations of eastern red bats offshore as well as recent acoustic survey results (Hatch et al. 2013; Peterson et al. 2014; Sjollema et al. 2014). Although little local data are available, shipboard and stationary acoustic surveys recorded several observations of bats flying over the ocean, with detections of migratory tree bats near the Lease Area (Stantec 2018). Tree bats may pass through the Lease Area during the migration period because they have been detected in the offshore environment primarily during late summer and fall. However, because bat movement offshore is generally limited to fall migration and bat activity offshore primarily occurs during wind speeds below 5.0 m/s, exposure to the Lease Area is expected to be low as the average wind speeds in the Lease Area are between 5 and 10 m/s with stronger wind in the winter (bri 2021:Section 4.2.4.1). Therefore, there is little evidence of bat use of the offshore environment and a low proportion of the population is exposed.

Onshore

In July 2020, vhb performed acoustic presence-absence surveys for the federally threatened northern long-eared bat along the onshore transmission cable route and within the proposed OnSS parcel (vhb 2021). Automated and qualitative analysis of acoustic data did not detect presence of the northern long-eared bat or the tri-colored bat, which is a candidate species for listing under the Endangered Species Act (ESA). Call data were auto classified with Bat Call Identification East, Version 2.8b, which resulted in the detection of the following species: big brown bat (n = 540 calls), eastern red bat (n = 891 calls), hoary bat (n = 23 calls), and silver-haired bat (n = 130 calls). Qualitative analysis of unknown species of concern calls confirmed 11 big brown bat calls and 135 eastern red bat calls (vhb 2021).

Special-Status Bat Species

The official species list generated by Information for Planning and Consultation (IPaC) on September 28, 2019, indicates that the federally threatened northern long-eared bat has the potential to occur within the footprint of the onshore facilities (vhb 2021). A Final 4(d) Rule specific to "take" prohibitions of the northern long-eared bat was published in the *Federal Register* on January 14, 2016 (U.S. Fish and Wildlife Service [USFWS] 2016). *Take* is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any species listed under the ESA. The IPaC list also indicates that there are no critical habitats associated with the northern long-eared bat within the GAA. The range of the federally endangered Indiana bat (*Myotis sodalis*) does not include Rhode Island, and historical records of the Indiana bat demonstrate its presence only in Berkshire and Hampden Counties in Massachusetts (last recorded in 1939; Mass.gov 2019). The Indiana bat is also not among species of bats documented offshore (Pelletier et al. 2013; Stantec 2016). For these reasons, this assessment focuses solely on the potential occurrence of northern long-eared bats within the GAA. A detailed species account and further information on this species is provided in the RWF biological assessment (BA) prepared for the USFWS (BOEM 2022).

Northern long-eared bats are not expected to occur within the Lease Area. A recent tracking study on Martha's Vineyard (n = 8; July–October 2016) did not record any offshore movements, and bats were presumed to hibernate on the island (Dowling et al. 2017). However, shipboard acoustic sampling near the SFWF detected a single northern long-eared bat call 21.1 miles (34 km) offshore (Stantec 2018). Most other northern long-eared bat passes detected during these surveys were 3 to 9 miles (5–14 km) offshore. Stationary acoustic detectors positioned on two turbines within the operational Block Island Wind Farm did not detect any northern long-eared bat calls (Stantec 2018, 2020). Similarly, vessel-based surveys at the construction site of the Block Island Wind Farm in 2016 did not detect any *Myotis* species (Stantec 2016). If northern long-eared bats were to migrate over water, most movements would likely be near the mainland. The related little brown bat has been documented migrating from Martha's Vineyard to Cape Cod, and northern long-eared bats may likewise migrate to mainland hibernacula from these islands in August and September (Dowling et al. 2017). Given that there is little evidence of use of the offshore environment by northern long-eared bats, exposure is expected to be minimal, and this species is not further assessed. This conclusion is also consistent with the Vineyard Wind BA (BOEM 2020).

3.5.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential bat impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

<u>Cable emplacement/maintenance:</u> A small amount of infrequent construction impacts associated with onshore power infrastructure would be required over the next 6 to 10 years to tie future offshore wind energy projects to the electric grid. Typically, this would require only small amounts of habitat removal, if any, and would occur in previously disturbed areas. Short-term temporary impacts associated with habitat loss or avoidance during cable emplacement/maintenance may occur, but no injury or mortality of bat individuals would be expected. Cable emplacement/maintenance is therefore expected to have **negligible** adverse impacts on bats.

<u>Light:</u> Lighting sources on the WTGs and OSSs may serve as an attractant to bats as they navigate, or bats may be indirectly attracted to insect prey drawn to the lights. The lack of bat carcasses reported during large-scale bird-related fatality events at illuminated lighthouses, lightships, and oil or research platforms indicates that bats do not appear to be as susceptible to these types of collision risks as some birds (Stantec 2018). The wind turbines may also be lit with aviation lighting; however, aviation lighting has not been found to influence bat collision risk at onshore facilities in North America (Arnett et al. 2008). Based on collision mortalities documented at onshore wind farms, the behavioral vulnerability to collision due to offshore lighting for all bat species would be **negligible** adverse.

<u>Noise:</u> Anthropogenic noise on the OCS associated with future offshore wind development, including noise from pile driving and construction activities (e.g., use of noise-producing heavy equipment or machinery), could impact bats on the OCS. Noise from pile driving would occur during installation of

foundations for offshore structures at a frequency of 4 to 6 hours at a time over 6 to 10 years. Construction activity would be short term, temporary, and highly localized. Further, the majority of these activities would take place during the day while bats are in torpor. A study evaluated the effect of noise on torpid bats and found that bats responded most strongly to colony and vegetation noise and most weakly to traffic noise (Luo et al. 2014). The study also documented evidence that torpid bats can rapidly habituate to repeated and prolonged noise disturbance, suggesting that traffic noise is less disturbing to torpid bats than colony or vegetation noise (Luo et al. 2014). Another study found that bats avoided foraging areas subjected to strong noise impacts (Schaub et al. 2008). This study suggests that foraging areas close to highways and other sources of intense broadband noises are degraded in their suitability as foraging areas for “passive listening” bats (Schaub et al. 2008). Because most construction activities would generally not be conducted during the active bat foraging period between twilight and sunrise, most noise generated from construction activities is not expected to impact bat foraging behavior. Luo et al. (2014) demonstrated that bat response to traffic noise was low relative to other stimuli (e.g., colony noise, vegetation) and that bats rapidly habituate to prolonged noise disturbance. Auditory impacts are not expected to occur because recent research shows that bats may be less sensitive to temporary threshold shifts than other terrestrial mammals (Simmons et al. 2016). Construction activities could generate noise sufficient to cause avoidance behavior by individual migrating tree bats (Schaub et al. 2008), thus potentially causing habitat-related impacts (i.e., displacement). These impacts would likely be limited to behavioral avoidance of pile driving and/or construction activities (e.g., use of noise-producing heavy equipment or machinery), and no temporary or permanent hearing loss would be expected (Simmons et al. 2016). However, these impacts are unlikely because little use of the OCS is expected by bats, and only during spring and fall migrations. Therefore, based on available information, noise impacts resulting from construction of offshore facilities would be temporary **negligible** adverse.

Some potential for short-term, temporary, and localized habitat impacts arising from onshore construction noise exists; however, no auditory impacts on bats would be expected. As discussed with offshore construction noise, recent literature suggests that bats are less susceptible to temporary or permanent hearing loss from exposure to intense sounds (Simmons et al. 2016). Impacts would be limited to individuals roosting adjacent to onshore construction locations. Nighttime work may be required on an as-needed basis, which could impact foraging bats. Some temporary displacement and/or avoidance of potentially suitable foraging habitat could occur, but these impacts would not be biologically significant. Some bats roosting near construction activities may be disturbed during construction, but they would move to a different roost farther from construction noise. This would not result in any impacts because frequent roost switching is common among bats (Hann et al. 2017; Whitaker 1998). Based on available information, noise impacts resulting from construction of the onshore facilities would be temporary **negligible** adverse.

Nonroutine activities associated with offshore wind facilities would generally require intense temporary activity to address emergency conditions. The noise made by onshore construction equipment or offshore repair vessels could temporarily deter bats from approaching the site of a given nonroutine event. Impacts on bats, if any, would be temporary and last only as long as repair or remediation activities were necessary to address these nonroutine events.

Given the temporary and localized nature of potential impacts and bats’ expected biologically insignificant response, impacts on bats are expected to be **negligible** adverse. No individual fitness (i.e., a bat's ability to survive and reproduce) or population-level impacts would occur as a result of onshore or offshore noise associated with future offshore wind development.

Presence of structures: In addition to electrical infrastructure, some habitat conversion may result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures. The general trend along the coastal region from Virginia to Maine is that port activity will increase modestly and require some conversion of undeveloped land to meet port demand and will result in permanent habitat loss for local bat populations. However, the noticeable increase from future offshore wind development would be a minimal contribution in the port expansion required to meet increased commercial, industrial, and recreational demand (BOEM 2019b). The current bearing capacity of existing ports is considered suitable for wind turbines, requiring no port modifications for supporting offshore wind energy development (U.S. Department of Energy [2014]).

Using the assumptions in Table E-4 in Appendix E, the cumulative offshore wind activities scenario would include up to 3,008 WTGs on the OCS that could result in potential impacts on bats. Cave bats (including the federally threatened northern long-eared bat and the state-endangered eastern small-footed bat, little brown bat, and tri-colored bat) rarely occur offshore (even during fall migration) and, therefore, exposure to construction vessels during construction or maintenance activities, or the rotor swept zone (RSZ) of operating WTGs in the lease areas, is expected to be **negligible** adverse, if exposure occurs at all (Pelletier et al. 2013).

Tree bats, however, may pass through offshore WEAs on the OCS during the fall migration, with limited potential for migrating bats to encounter vessels during construction and decommissioning of WTGs, electric service platforms, and offshore export cable corridors, although structure and vessel lights may attract bats because of the increased prey abundance. As discussed above, although bats have been documented at offshore islands, relatively little bat activity has been documented in open water habitat similar to the conditions in the WEAs (Stantec 2018, 2020). Several studies, such as Cryan and Barclay (2009), Cryan et al. (2014), and Kunz et al. (2007), discuss several hypotheses as to why bats may be attracted to WTGs. Many of these, including the creation of linear corridors, altered habitat conditions, or thermal inversions, would not apply to WTGs on the Atlantic OCS (Cryan and Barclay 2009; Cryan et al. 2014; Kunz et al. 2007). Other hypotheses associated with the Atlantic OCS regarding bat attraction to WTGs include bats perceiving the WTGs as potential roosts, potentially increased prey base, visual attraction, disorientation due to electromagnetic fields or decompression, or attraction due to mating strategies (Arnett et al. 2008; Cryan 2007; Kunz et al. 2007). However, no definitive answer as to why, if at all, bats are attracted to WTGs has been postulated, despite intensive studies at onshore wind facilities. For this reason, some bats may encounter, or perhaps be attracted to, the expected structures (i.e., electric service platforms and non-operational WTG towers) to opportunistically roost or forage. However, bats' echolocation abilities and agility make it unlikely that these stationary objects (i.e., electric service platforms and non-operational WTGs) or moving vessels would pose a collision risk to migrating individuals. This assumption is supported by the evidence that bat carcasses are rarely found at the base of onshore turbine towers (Choi et al. 2020).

Tree bat species that may encounter operating WTGs in the offshore lease areas include the eastern red bat, the hoary bat, and the silver-haired bat. Offshore O&M would present a seasonal risk factor to migratory tree bats that may use offshore habitats during fall migration. Although some potential exists for migrating tree bats to encounter operating WTGs during fall migration, the overall occurrence of bats on the OCS is relatively very low (Stantec 2016). With the proposed 1-nm (1.9-km) spacing between structures associated with future offshore wind development and the distribution of anticipated projects, individual bats migrating over the OCS within the RSZ of project WTGs would likely pass through projects with only slight course corrections, if any, to avoid operating WTGs. Further, unlike terrestrial migration routes there are no landscape features that would concentrate bats and increase exposure to the WEAs on the OCS (Baerwald and Barclay 2009; Cryan and Barclay 2009; Fiedler 2004; Hamilton 2012; Smith and McWilliams 2016). This combined with the expected infrequent and limited use of the OCS by migrating tree bats suggests very few individuals would encounter operating WTGs or other structures associated with future offshore wind development. Additionally, the potential collision risk to migrating tree bats varies with climatic conditions. For example, bat activity is associated with relatively low wind speeds and warm temperatures (Arnett et al. 2008; Cryan and Brown 2007; Fiedler 2004; Kerns et al. 2005). Given the rarity of tree bats in the offshore environment, the turbines being widely spaced apart, and the patchiness of expected projects on the OCS, the likelihood of collisions is expected to be low. Additionally, the likelihood of a migrating individual encountering one or more operating WTGs during adverse weather conditions is extremely low because bats have been shown to suppress activity during periods of strong winds, low temperatures, and rain (Arnett et al. 2008; Erickson et al. 2002).

For these reasons, the likelihood of exposure of tree bats to construction vessels during construction or maintenance activities, or the RSZ of operating WTGs in the lease areas, is very low, and therefore related impacts are expected to be **negligible** adverse.

3.5.1.2 Conclusions

Under the No Action Alternative, the Project would not be built. Impacts from ongoing future non–offshore and offshore wind development activities would still occur. BOEM expects ongoing activities, future non–offshore wind development, and future offshore wind development to have continuing temporary to permanent impacts (e.g., disturbance, displacement, injury, mortality, and habitat conversion) on bats primarily through the onshore construction impacts, the presence of structures, and climate change. BOEM anticipates that the potential impacts of ongoing activities would be **negligible** adverse. In addition to ongoing activities, BOEM anticipates that the impacts of planned actions other than offshore wind development may also contribute to impacts on bats, including increasing onshore construction (see Appendix E1), but that these impacts would be **negligible** adverse. BOEM expects the combination of ongoing and planned actions other than offshore wind development to result in **negligible** adverse impacts on bats. Although the impacts from a substitute project may differ in location and time, depending on where and when offshore wind facilities are developed to meet the remaining demand, the nature of impacts and the total number of WTGs would be similar either with or without the Proposed Action. The No Action Alternative would forgo applicant-committed postconstruction acoustic monitoring for bats and annual mortality reporting. Their results could provide an understanding of the effects of offshore wind development, benefit the future management of these species, and inform planning of other offshore development. However, ongoing and future surveys and monitoring could still supply similar data.

Considering all the IPFs together, BOEM anticipates that the overall impacts associated with future offshore wind activities in the GAA would result in **negligible** adverse impacts from ongoing climate change, lighting, interactions with operating WTGs on the OCS, and onshore habitat loss. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration, as well as cave bats not typically occurring on the OCS, the IPFs associated with future offshore wind activities that occur offshore would not appreciably contribute to overall impacts on bats. Future offshore wind development could result in some potential for temporary disturbance and permanent loss of onshore bat habitat. However, habitat removal is anticipated to be minimal when compared to other past, present, and reasonably foreseeable activities. Any impacts resulting from habitat loss or disturbance would not be expected to result in individual fitness or population-level effects within the GAA.

3.5.2 Environmental Consequences

3.5.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

This assessment analyzes the maximum-case scenario; however, there is the potential for variances in the proposed Project build-out, as defined in the PDE (see Appendix D). The Project design parameters that would influence the magnitude of the impacts on bats include the number, size, and location of WTGs; the location of the OnSS and ICF; the type of lighting to be used; the location of construction within the landfall work area and within the transmission cable envelope; and the time of year during which construction occurs. Impacts associated with construction of the onshore elements of the Proposed Action during the active season for bats (generally April through October) could be avoided if onshore construction occurs outside this time frame.

The following EPMs would be implemented to minimize potential impacts to bats:

- Revolution Wind evaluated siting alternatives for the OnSS using the criteria that included avoidance or minimization of disturbance to ecologically sensitive areas.
- The OnSS and ICF would be located on parcels that are already highly altered and include buried demolition waste.
- The transmission cable would be located primarily in unvegetated and previously disturbed or developed ROWs.

These EPMs would be implemented across all alternatives; therefore, BOEM would not expect measurable potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for bats across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse impact are excluded from Chapter 3 and provided in Table E1-4 in Appendix E1. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

Table 3.5-1 discloses IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

The overall impact to bats from any action alternative would be **minor** adverse, as the effects would be small, and the resource would recover completely, with no mitigating action required. The conclusion section for each alternative analysis provides additional rationale for this impact determination.

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Table 3.5-1. Alternative Comparison Summary for Bats

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTGs	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Cable emplacement/ maintenance	Only small amounts of habitat removal, if any, would be required by onshore power infrastructure construction and would occur in previously disturbed areas. Short-term temporary impacts associated with habitat loss or avoidance during cable emplacement/maintenance may occur, but no injury or mortality of bat individuals would be expected. Cable emplacement/maintenance is therefore expected to have **negligible** adverse impacts on bats.	**Onshore**: The onshore transmission cable route would be located primarily in unvegetated and previously disturbed or developed ROWs that do not provide high-quality habitat for bats; however, some of the alternative routes under consideration within the transmission cable envelope contain segments that would pass through undeveloped, vegetated areas comprised of upland forest and shrubland. The preferred transmission cable route is an approximate 1-mile (1.6-km) route that would predominantly follow along paved roads or previously disturbed areas such as parking lots. Based on Project timing, the limited area of effect relative to available habitat, and the proposed impact avoidance and minimization measures, adverse construction impacts of the Proposed Action on northern long-eared bat would be **negligible** adverse. O&M impacts resulting from vegetation clearing would be reduced by observing time-of-year restrictions on vegetation removal to avoid bats' breeding season and therefore, **negligible** adverse. Impacts from land disturbance during decommissioning would be similar to those described within the construction impact analysis, although the impacts would likely be less because new vegetation clearing and grading would not be necessary. Onshore construction and installation would add to other limited onshore bat habitat disturbance actions through the removal of approximately 1.6 acres (0.6 ha) of mixed oak/white pine forest at the ICF but would not result in population-level effects given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity. Therefore, the cumulative impact of the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** adverse impacts to bats.	**Onshore**: Alternatives C through F would not alter onshore activities. Therefore, construction, O&M, and decommissioning impacts would be the same as those described for the Proposed Action: short term **negligible** adverse. Likewise, cumulative impacts would be the same as those described for the Proposed Action: short term **negligible** to **minor** adverse impacts.			
Light	Lighting sources on the WTGs and OSSs may serve as an attractant to bats as they navigate, or bats may be indirectly attracted to insect prey drawn to the lights. But based on collision mortalities documented at onshore wind farms, the behavioral vulnerability to collision due to offshore lighting for all bat species would be **negligible** adverse.	**Offshore**: Bats may demonstrate attraction to or avoidance of construction vessels installing offshore facilities. Exposure to vessels and installation infrastructure would be temporally limited to the construction period. Thus, behavioral changes due to lighting on construction vessels would be temporary, and impacts to bats would be **negligible** adverse, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the airspace of the RWF. Lighting during the O&M phase of the Project would be limited, which should reduce insect and potential bat attraction (Stantec 2018). Revolution Wind would comply with FAA (2018) and BOEM (2021c) requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimize impacts on bat species. Overall, collision-related mortality or injury from lighting at the offshore facilities could result in **negligible** to **minor** adverse impacts to bats at the RWF, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the airspace of the RWF. The Proposed Action would add up to 100 new WTGs with red flashing aviation hazard lighting to the offshore environment. Vessel lights during construction and installation, O&M, and decommissioning would be minimal and limited to vessels transiting to and from construction areas. Ongoing and future non–offshore wind activities are expected to cause permanent impacts, primarily driven by light from offshore structures and short-term and localized impacts from vessel lights. For these reasons, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** adverse cumulative impacts to bats, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the Lease Area.	**Offshore**: No measurable change from Proposed Action construction impacts is anticipated for Alternatives C through F because the number and duration of construction vessels and work areas requiring nighttime lighting would be the same as described for the Proposed Action. Alternatives C through F would reduce operational nighttime lighting due to a reduced number of lighted structures, thereby negligibly decreasing the risk of bat injury or mortality from collision with WTGs. However, impacts to bats from offshore lighting under these alternatives would likely be the same as those described for the Proposed Action: **negligible** to **minor** adverse. Alternatives C through F would add up 56 to 93 new WTGs with red flashing aviation hazard lighting to the offshore environment. Additionally, marine navigation lighting would include one or more flashing white lights on each WTG and the OSSs and would be directed out and down to the water surface. Vessel lights during construction and installation, O&M, and decommissioning would be minimal and limited to vessels transiting to and from construction areas. These lights could serve as an attractant to bats as they navigate, or bats may be indirectly attracted to insect prey drawn to the lights. Ongoing and future non–offshore wind activities are expected to cause permanent impacts, primarily driven by light from offshore structures and short-term and localized impacts from vessel lights. For these reasons, Alternatives C through F, when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** adverse cumulative impacts to bats, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the Lease Area.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTGs	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
		Onshore: Most construction activities would occur during the day over the approximately 1-year construction period for the onshore facilities, impacts from lighting on bats would be **negligible** adverse. During the O&M of the OnSS and ICF, general yard lighting would be used for assessment of equipment. In general, lighting would be off at night unless there is work in progress or lights are left on for safety and security purposes. Because the use of lighting at night is expected to be infrequent, the impacts it has on temporary bat displacement and/or behavior disruption would be **negligible** adverse. Lighting from construction and operations could add to baseline light sources and activities associated with other onshore projects. When considered in the context of the other nearby commercial and industrial lighting within the GAA, BOEM expects **negligible** adverse cumulative impacts to bats.	**Onshore**: Alternatives C through F would not alter onshore activities. Therefore, impacts would be the same as those described for the Proposed Action: temporary to short term **negligible** adverse.			
Noise	Anthropogenic noise on the OCS associated with future offshore wind development, including noise from pile driving and construction activities (e.g., use of noise-producing heavy equipment or machinery), could impact bats on the OCS. Construction activity would be short term, temporary, and highly localized; however, no auditory impacts on bats would be expected. Given the temporary and localized nature of potential impacts and bats' expected biologically insignificant response, impacts on bats are expected to be **negligible** adverse. No individual fitness (i.e., a bat's ability to survive and reproduce) or population-level impacts would occur as a result of onshore or offshore noise associated with future offshore wind development.	**Offshore**: Pile-driving noise and offshore construction noise associated with the Proposed Action would be short term, temporary, and highly localized and is expected to result in **negligible** adverse impacts. Increases in activity and associated disturbances during RWF maintenance activities would have a short-term **negligible** adverse impact on bats because of the limited additional vessel activity and low likelihood of bat occurrence near the RWF. There would also be no impacts to bats during O&M of the offshore RWEC because these components are underwater, and there would be no routine maintenance at these components. Pile-driving and other construction noise and activity associated with the Proposed Action would add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. Therefore, the cumulative impact of the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** adverse impacts to bats.	**Offshore**: Alternatives C through F would slightly decrease construction impacts on bats from noise associated with pile driving for WTGs as compared to the Proposed Action. Impacts, if any, would be temporary, limited to behavioral avoidance, and localized and would be the same as those described for the Proposed Action: short term **negligible** adverse. No measurable change from Proposed Action O&M impacts is anticipated because operational noise sources and levels would be the same: short term **negligible** adverse. Pile driving and other construction noise and activity associated with Alternatives C through F would add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. However, Alternatives C through F's contribution would be limited in duration and cease when construction ends. Therefore, these alternatives when combined with other past, present, and reasonably foreseeable projects would result in short- to long-term **negligible** to **minor** adverse cumulative impacts to bats.			
		Onshore: Some potential for short-term, temporary, and localized habitat impacts arising from onshore construction noise exists; however, no auditory impacts on bats would be expected. Therefore, noise impacts resulting from construction and installation of the onshore facilities would be temporary **negligible** adverse. Most activities would generally not be conducted during the active bat foraging period between twilight and sunrise, thus noise from maintenance activities is not expected to impact bat foraging behavior. Noise and traffic resulting from operation of the onshore facilities would be temporary and **negligible** adverse. Impacts to bats from noise during decommissioning would be similar to that described for construction activities. Construction noise and activities associated with construction and operation of the onshore facilities could add to baseline noise and activity associated with other onshore projects with overlapping construction periods. Normal operation of the OnSS would generate continuous noise, but BOEM	**Onshore**: Alternatives C through F would not alter onshore activities. Therefore, impacts would be the same as those described for the Proposed Action: temporary to long-term **negligible** adverse.			

Impact-Producing Factor	**No Action Alternative**	**Alternative B (Proposed Action) up to 100 WTGs**	**Alternative C (Habitat Alternative) 64–65 WTGs**	**Alternative D (Transit Alternative) 78–93 WTGs**	**Alternative E (Viewshed Alternative) 64–81 WTGs**	**Alternative F (Higher Capacity Turbine Alternative) 56 WTGs**
		expects long-term **negligible** adverse associated impacts when considered in the context of the other commercial and industrial noises nearby.				
Presence of structures	Some habitat conversion may result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures. However, the noticeable increase from future offshore wind development would be a minimal contribution in the port expansion required to meet increased commercial, industrial, and recreational demand (BOEM 2019b). Cave bats rarely occur offshore and given the rarity of tree bats in the offshore environment, the likelihood of exposure of cave and tree bats to construction vessels during construction or maintenance activities, or the RSZ of operating WTGs in the lease areas, is very low. Therefore, related impacts are expected to be **negligible** adverse.	**Offshore**: Exposure to vessels and installation infrastructure would be temporally limited to the construction period. Behavioral vulnerability to collision with construction equipment is expected to be **negligible** adverse. Collisions between bats and OSSs could cause injury and/or mortality. However, in general, these objects would not pose a collision risk because of a bat's ability to echolocate and detect stationary structures (Stantec 2018). Bat activity can be expected to be low during WTG operation and limited to warmer periods in the summer or during fall migration. Thus, the risk of injury and/or mortality to bats would be **negligible** to **minor** adverse. The structures associated with the Proposed Action, and the consequential **negligible** to **minor** adverse impacts, would remain at least until decommissioning of the Project is complete. The Project's contribution to impacts on bats would be limited because migrating bats rarely use the OCS and the Project would account for less than 4% of the total future structures on the OCS. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in long-term **negligible** to **minor** adverse cumulative impacts to bats.	**Offshore**: Alternatives C through F would reduce the number of WTGs, potentially resulting in a reduced amount of offshore construction equipment and vessels required. However, because bat exposure to vessels and installation infrastructure would be temporally limited to the construction period, the behavioral vulnerability to collision with construction equipment under Alternatives C through F is expected to be the same as described for the Proposed Action: short term **negligible** adverse. During operation, Alternatives C through F would reduce the number of WTGs as compared to the Proposed Action and potentially allow for improved maneuverability for bats through the Lease Area and negligibly decreases the risk of injury or mortality from collision with WTGs. However, impacts to bats from the presence of structures under these alternatives would not be substantially reduced and would likely be the same as those described for the Proposed Action: long term **negligible** to **minor** adverse. Alternatives C through F would add 56 to 93, additional WTGs and up to two OSSs to the No Action Alternative. Therefore, the total cumulative structures would be 3,066 to 3,103. Impacts to migration patterns or collision risk from these additional turbines would persist until decommissioning is complete. However, the Project's contribution to impacts on bats would be limited because migrating bats rarely use the OCS and the Project would account for less than 4% of the total future structures on the OCS. Therefore, these alternatives, when combined with past, present, and reasonably foreseeable projects would result in long-term **negligible** to **minor** adverse cumulative impacts to bats.			
		Onshore: Impacts on mortality and injury from the onshore construction operations would be avoided by observing time-of-year restrictions on vegetation removal that would avoid the breeding season of bats (see COP Table ES-1). Therefore, these temporary impacts, if any, from construction equipment and ongoing activity would be **negligible** adverse. The OnSS and ICF would be visible structures that would result in permanent bat habitat conversion and loss. Land disturbance as it relates to vegetation clearing may result in the direct injury or mortality of bats. However, mortality and injury risk would be reduced by observing time-of-year restrictions on vegetation removal to avoid bats' breeding season. Collisions between bats and onshore facilities could cause mortality. However, in general, these objects would likely not pose a collision risk because of a bat's ability to echolocate and detect stationary structures (Stantec 2018). Therefore, the impacts to bats from the presence of onshore facilities would be long term **negligible** adverse. The contribution of the Proposed Action to cumulative impacts would not result in population-level effects given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity. The combined impacts on bats from habitat loss would likely be long term **negligible** adverse given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity.	**Onshore**: Alternatives C through F would not alter onshore activities. Therefore, impacts would be the same as those described for the Proposed Action: temporary to long-term **negligible** adverse.			

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3.5.2.2 Alternative B: Impacts of the Proposed Action Alternative on Bats

3.5.2.2.1 Construction and Installation

Offshore Activities and Facilities

Light: Bats may demonstrate attraction to or avoidance of construction vessels installing offshore facilities, particularly if insects (i.e., prey) are drawn to the lights of the vessels (BOEM 2014). Exposure to vessels and installation infrastructure would be temporally limited to the construction period. Thus, behavioral changes due to lighting on construction vessels would be temporary, and impacts to bats would be **negligible** adverse, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the airspace of the RWF.

Noise: Pile-driving noise and offshore construction noise associated with the Proposed Action would be short term, temporary, and highly localized and is expected to result in **negligible** adverse impacts. Auditory impacts are not expected to occur as recent research shows that bats may be less sensitive to temporary threshold shifts than other terrestrial mammals (Simmons et al. 2016). Impacts, if any, would be limited to behavioral avoidance of pile-driving and/or construction activities, and no temporary or permanent hearing loss would be expected (Simmons et al. 2016).

Presence of structures: Bats are expected to seasonally occur in the Lease Area while migrating, commuting, or foraging. Bats were observed roosting aboard support vessels during the construction of the Block Island Wind Farm (Stantec 2016), suggesting the presence of artificial roosting structures may provide some benefit to bats in the offshore environment. Bats are well known for their ability to detect objects with echolocation (Horn et al. 2008; Johnson et al. 2004) and thus are unlikely to collide with stationary structures (Cryan 2011). Further, exposure to vessels and installation infrastructure would be temporally limited to the construction period. Behavioral vulnerability to collision with construction equipment is expected to be **negligible** adverse.

Onshore Activities and Facilities

Cable emplacement/maintenance: The preferred transmission cable route is an approximately 1-mile (1.6-km) route, that would predominantly follow along paved roads or previously disturbed areas such as parking lots that do not provide high-quality habitat for bats. However, some of the alternative routes under consideration within the transmission cable envelope contain segments that would pass through undeveloped, vegetated areas composed of upland forest and shrubland and would be approximately the same length (see Section 3.8). Impacts associated with construction of the onshore transmission cable could occur if construction activities take place during the active season for bats (generally April through October). Such activities may result in injury or mortality of individual bats, particularly juveniles as they are unable to flush from a roost if occupied by bats at the time of removal. However, tree and shrub removal would occur outside the bat roosting period (from May 1 through August 15) when feasible (see COP Table ES-1), thus limiting the potential for direct injury or mortality from the removal of occupied roost trees. There would be some potential for adverse impacts on bats as a result of the loss of potentially suitable roosting and/or foraging habitat, but these impacts would be **negligible** adverse.

BOEM anticipates that **negligible** adverse impacts, if any, would occur with adherence to USFWS northern long-eared bat conservation measures and that **negligible** adverse habitat impacts would not result in individual fitness or population-level effects given the limited amount of habitat removal and the presence of high-quality bat habitat in the vicinity. Based on Project timing, the limited area of effect relative to available habitat, and the proposed impact avoidance and minimization measures, adverse impacts of the Proposed Action on northern long-eared bat would be **negligible** adverse. A detailed impacts analysis to northern long-eared bats from Project construction activities is provided in the USFWS BA (BOEM 2022).

<u>Light:</u> Some overnight lighting would occur during construction of the onshore facilities. Wildlife typically not exposed to light, such as bats, may behave differently if exposed to light at nighttime. Because most construction activities would occur during the day over the approximately 1-year construction period for the onshore facilities, impacts from lighting on bats would be **negligible** adverse.

<u>Noise:</u> Some potential for short-term, temporary, and localized habitat impacts arising from onshore construction noise exists; however, no auditory impacts on bats would be expected. As discussed with offshore construction noise, recent literature suggests that bats are less susceptible to temporary or permanent hearing loss from exposure to intense sounds (Simmons et al. 2016). Based on available information discussed in Section 3.5.1.1, noise impacts resulting from construction and installation of the onshore facilities would be temporary **negligible** adverse.

<u>Presence of structures:</u> Visible structures (i.e., construction equipment) would be present during construction of the onshore facilities. Collisions between bats and vehicles or construction equipment could cause injury and/or mortality. However, in general, these objects would not pose a collision risk because of a bat's ability to echolocate and detect stationary structures (Stantec 2018). The operational footprints of the OnSS and ICF would result in habitat loss when forested upland is cleared and replaced with hard structures and crushed gravel yards. The ICF would result in a loss of approximately 1.6 acres (0.6 ha) of mixed oak/white pine forest, which is reflective of the operational footprint of the ICF. The OnSS would create a loss of 3.8 acres (1.5 ha) of mixed oak/white pine forest and 0.6 acre (0.2 ha) of ruderal pitch pine barren. Together, these losses represent a relatively small fraction of the 52 acres (21 ha) of contiguous bat habitat identified in the *Rhode Island Wildlife Action Plan* (RIWAP) (vhb 2021). Impacts on mortality and injury from the onshore construction operations would be avoided by observing time-of-year restrictions on vegetation removal that would avoid the breeding season of bats (see COP Table ES-1). Therefore, these temporary impacts, if any, from construction equipment and ongoing activity would be **negligible** adverse.

3.5.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

<u>Light:</u> Lighting sources on the WTGs and OSSs may serve as an attractant to bats as they navigate, or bats may be indirectly attracted to insect prey drawn to the lights. However, bats do not appear to be as susceptible to these types of collision risks as some birds (Stantec 2018), and aviation lighting has not been found to influence bat collision risk at onshore facilities in North America (Arnett et al. 2008). Lighting during the O&M phase of the Project would be limited, which should reduce insect and potential bat attraction (Stantec 2018). Revolution Wind would comply with FAA (2018) and BOEM (2021c) requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimize impacts on bat species. Overall, collision-related mortality or injury from lighting at the offshore facilities could result in **negligible** to **minor** adverse impacts to bats at the RWF, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the airspace of the RWF.

Noise: Boat activity and noise already occur within and adjacent to the Lease Area based on existing levels of vessel traffic, as described in Section 3.16. Increases in activity and associated disturbances during RWF maintenance activities would have a short-term **negligible** adverse impact on bats because of the limited additional vessel activity and low likelihood of bat occurrence near the RWF. There would also be no impacts to bats during O&M of the offshore RWEC because these components are underwater, and there would be no routine maintenance at these components.

Presence of structures: During Project O&M, injury or mortality from collision with WTGs represents the greatest potential risk to bats. WTGs and other offshore facilities may also provide roosting opportunities for bats. Collisions between bats and OSSs could cause injury and/or mortality. However, in general, these objects would not pose a collision risk because of a bat's ability to echolocate and detect stationary structures (Stantec 2018). Additionally, individual bats could collide with WTGs, resulting in mortality or injury. It is difficult to confirm bat fatalities at offshore WTGs; however, offshore bat occurrences are infrequent and primarily seasonal (during migration), and activity declines as the distance from shore increases. Existing data from meteorological buoys provide the best opportunity to further define bat use of open-water habitat far from shore where Project WTGs are proposed. Relatively few bat passes were detected at meteorological buoy sites, and use was sporadic when compared to sites on offshore islands (Stantec 2016). In general, the bat species assessed are not expected to regularly forage in the Lease Area, but some may be present during migration, particularly in the fall (BOEM 2012; Stantec 2018).

Specific weather conditions may contribute to bat mortality from turbines. Mortality data from onshore wind farms indicate that bat collision mortality is expected to occur mainly on nights with calm winds during migratory periods as relatively more bats are migrating at greater altitudes in favorable conditions (Arnett et al. 2008). Likewise, coastal and offshore acoustic studies (Stantec 2016) found that greater wind speeds and cool temperatures have an adverse effect on bat activity. However, during fall migration, bats may take advantage of favorable wind directions and may be more likely to fly during colder weather (Stantec 2016). Most offshore bat activity took place at wind speeds less than 5 m/s. Because average wind speeds in the Lease Area are between 5 and 10 m/s, with stronger wind in the winter, bat activity can be expected to be low during WTG operation and limited to warmer periods in the summer or during fall migration. Thus, the risk of injury and/or mortality to bats would be **negligible** to **minor** adverse. The structures associated with the Proposed Action, and the consequential **negligible** to **minor** adverse impacts, would remain at least until decommissioning of the Project is complete. Impacts from O&M of the RWF to the listed northern long-eared bat are not expected because of their low collision risk and the rarity of their occurrence offshore. A detailed impacts analysis to northern long-eared bats from Project operation and decommissioning is provided in the USFWS BA (BOEM 2022).

Onshore Activities and Facilities

Cable emplacement/maintenance: Hazard tree removal would be performed on a cyclical basis to inspect and remove trees that may fall that are outside the edge of the maintained ROW. However, mortality and injury risk would be reduced by observing time-of-year restrictions on vegetation removal to avoid bats' breeding season. Therefore, the impacts resulting from vegetation clearing would be **negligible** adverse. Impacts from land disturbance during decommissioning would be similar to those described within the construction impact analysis, although the impacts would likely be less because new vegetation clearing and grading would not be necessary.

Light: During the O&M of the OnSS and ICF, general yard lighting would be used for assessment of equipment. In general, lighting would be off at night unless there is work in progress or lights are left on for safety and security purposes. Insect prey could be drawn in by lighting at the OnSS and ICF and thus attract foraging bats. However, the surrounding area is currently developed, and lighting-related effects would be abated using minimum-intensity and motion-activated lighting and shielding and downward angling light sources where practicable. As during construction of the onshore facilities, lighting at night has the potential to temporarily displace bats and/or disrupt normal behavior. Because the use of lighting at night is expected to be infrequent, the impacts it has on temporary bat displacement and/or behavior disruption would be **negligible** adverse.

Noise: According to vhb's onshore acoustic assessment (vhb 2021), during O&M, the proposed OnSS and ICF would introduce new sources of sound, which are modeled to be 45.5 A-weighted decibels (dBA) equivalent sound level (Leq) or less when measured at the nearest anthropogenic sensitive receptors and fall within the ambient sound range measured at baseline conditions. Temporary noise and construction-related traffic may occasionally be generated due to nonroutine maintenance. Pickup trucks may be used to make routine visits to the OnSS and ICF during O&M. Occasional O&M emergency visits may necessitate bucket trucks, cranes, and similar vehicles. Infrequent vehicle usage within the OnSS and ICF may create temporary noise-related disturbance to bats adjacent to the OnSS. However, most activities would generally not be conducted during the active bat foraging period between twilight and sunrise, thus noise from maintenance activities is not expected to impact bat foraging behavior. Luo et al. (2014) demonstrated that bat response to traffic noise was low relative to other stimuli (e.g., colony noise, vegetation) and that bats rapidly habituate to prolonged noise disturbance. Based on this available information, noise and traffic resulting from operation of the onshore facilities would be temporary and **negligible** adverse. Impacts to bats from noise during decommissioning would be similar to that described for construction activities.

Presence of structures: The OnSS and ICF would be visible structures that would result in permanent bat habitat conversion and loss. Land disturbance in the form of vegetation management would occur on a periodic basis to maintain vegetation at shrub height within the operational footprint of the onshore facilities. Land disturbance as it relates to vegetation clearing may result in the direct injury or mortality of bats. However, mortality and injury risk would be reduced by observing time-of-year restrictions on vegetation removal to avoid bats' breeding season. Collisions between bats and onshore facilities could cause mortality. However, in general, these objects would likely not pose a collision risk because of a bat's ability to echolocate and detect stationary structures (Stantec 2018). Therefore, the impacts to bats from the presence of onshore facilities would be long term **negligible** adverse**.**

3.5.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Lighting: The Proposed Action would add up to 100 new WTGs with red flashing aviation hazard lighting to the offshore environment. Additionally, marine navigation lighting would include multiple flashing white lights on each WTG and the OSSs and would be directed out and down to the water surface. Vessel lights during construction and installation, O&M, and decommissioning would be minimal and limited to vessels transiting to and from construction areas. These lights could serve as an attractant to bats as they navigate, or bats may be indirectly attracted to insect prey drawn to the lights.

However, the lack of bat carcasses reported during large-scale bird-related fatality events at illuminated lighthouses, lightships, and oil or research platforms indicates that bats do not appear to be as susceptible to these types of collision risks as some birds (Stantec 2018). As such, ongoing and future non–offshore wind activities are expected to cause permanent impacts, primarily driven by light from offshore structures and short-term and localized impacts from vessel lights. For these reasons, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** adverse cumulative impacts to bats, with long-distance migratory bats most at risk because they are most likely to seasonally occur in the Lease Area.

Noise: Pile-driving and other construction noise and activity associated with the Proposed Action would add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. However, the Proposed Action's contribution to noise impacts would be limited in duration and cease when construction ends. Therefore, the cumulative impact of the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** adverse impacts to bats.

Presence of structures: The Proposed Action would add up to 100 additional WTGs and up to two OSSs to the No Action Alternative. Therefore, the total cumulative structures would be 3,110. Impacts to migration patterns or collision risk from these additional turbines would persist until decommissioning is complete. However, the Project's contribution to impacts on bats would be limited because migrating bats rarely use the OCS and the Project would account for less than 4% of the total future structures on the OCS. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in long-term **negligible** to **minor** adverse cumulative impacts to bats.

Onshore Activities and Facilities

Cable emplacement/maintenance: The transmission cable envelope contains approximately 0.56 acre (0.22 ha) of mixed oak/white pine forest, 0.32 acre of softwood forest, 0.02 acre of ruderal grassland/shrubland, 0.008 acre of oak forest, and 0.006 acre of pitch pine barren (see Section 3.8). Onshore construction and installation would add to other limited onshore bat habitat disturbance actions. Land disturbance associated with cable emplacement could result in the loss of potentially suitable roosting and/or foraging habitat for bats. However, the preferred transmission cable route is an approximate 1-mile (1.6-km) route that would predominantly follow along paved roads or previously disturbed areas such as parking lots. Further, Revolution Wind and other future land developers would adhere to USFWS northern long-eared bat conservation measures. As a result, cumulative impacts would not result in population-level effects given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity. Therefore, the cumulative impact of the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** adverse impacts to bats.

Light: The Proposed Action would involve the use of some overnight lighting during construction and installation and during O&M and decommissioning of the onshore facilities. O&M lighting of facilities would be switch activated and would only occur when O&M activities are ongoing. Lighting from construction and operations could add to baseline light sources and activities associated with other onshore projects. Because the use of lighting at night is expected to be infrequent, the impacts it has on temporary bat displacement and/or behavior would be short term **negligible** adverse. When considered in the context of the other nearby commercial and industrial lighting within the GAA, BOEM expects **negligible** adverse cumulative impacts to bats.

Noise: Construction noise and activities associated with construction and operation of the onshore facilities could add to baseline noise and activity associated with other onshore projects with overlapping construction periods. However, the Proposed Action's incremental contribution would be **negligible** adverse as it would be limited in duration and cease when construction ends. No individual fitness or population-level effects would be expected. Normal operation of the OnSS would generate continuous noise, but BOEM expects long-term **negligible** adverse associated impacts when considered in the context of the other commercial and industrial noises nearby.

Presence of structures: Onshore construction and installation would add to other limited onshore bat habitat disturbance actions through the removal of approximately 1.6 acres (0.6 ha) of mixed oak/white pine forest at the ICF. The OnSS would create a loss of 3.8 acres (1.5 ha) of mixed oak/white pine forest. This land disturbance could result in the loss of potentially suitable roosting and/or foraging habitat for bats. However, Revolution Wind and other future land developers would adhere to USFWS northern long-eared bat conservation measures, which would also minimize impacts to other roosting/foraging bat species. As a result, the contribution of the Proposed Action to cumulative impacts would not result in population-level effects given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity. The combined impacts on bats from habitat loss would likely be long term **negligible** adverse given the limited amount of habitat removal and the presence of high-quality habitat in the vicinity. Collisions between bats and structures have some limited potential to cause mortality. However, in general, these objects would not pose a collision risk because of a bat's ability to echolocate and detect stationary structures and therefore would not contribute to cumulative impacts to bats.

3.5.2.2.4 Conclusions

In summary, construction and installation, O&M, and decommissioning of the Proposed Action would have **negligible** to **minor** adverse impacts on bats, especially if conducted outside the active season. The main significant risk would be from operation of the offshore WTGs, which could lead to long-term **negligible to minor** adverse impacts in the form of collision-related mortality, although BOEM anticipates this to be rare. In the context of reasonably foreseeable environmental trends in the area, impacts of individual IPFs resulting from ongoing and planned actions, including the Proposed Action, would be **negligible** to **minor** adverse. Considering all the IPFs together, BOEM anticipates that the impacts from ongoing and planned actions, including the Proposed Action, would result in **negligible** to **minor** adverse impacts on bats in the GAA because of ongoing climate change, interactions with operating WTGs on the OCS, and onshore habitat loss. Future offshore wind activities are not expected to materially contribute to the IPFs discussed above. Given the infrequent and limited anticipated use of the OCS by migrating tree bats during spring and fall migration and that cave bats do not typically occur on the OCS, the IPFs associated with future offshore wind activities that occur offshore would not be expected to appreciably contribute to overall impacts on bats. Some potential for temporary disturbance and permanent loss of onshore habitat may occur as a result of future 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 Proposed Action would contribute to the overall impact rating primarily through the permanent impacts due to onshore habitat loss. Thus, the overall impacts on bats would be **minor** adverse because limited impacts are expected due to the minimal presence of bats within the Lease Area and bat populations would recover completely.

3.5.2.3 Alternatives C, D, E, and F

Table 3.5-1 provides a summary of IPF findings for these alternatives.

3.5.2.3.1 Conclusions

Alternatives C through F would reduce the number of WTGs, which subsequentially would reduce the potential collision risk for bats. Still, BOEM expects the overall impacts of these alternatives to bats would be similar to the Proposed Action: **negligible** to **minor** adverse.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternatives C through F's contribution to the cumulative impacts would be similar to the Proposed Action (ranging from **negligible** to **minor** adverse, depending on the IPF). The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **minor** adverse.

3.5.2.4 Mitigation

Conducting marine construction activities during approved in-water work windows, which would be developed in consultation with NMFS and USFWS, could further reduce the expected negligible to minor long-term impacts on bats (see Table F-2 in Appendix F for details). Implementation of Revolution Wind's *Avian and Bat Post-Construction Monitoring Framework* (see Appendix G and COP Appendix AA) would not reduce impacts; however, the data gathered from the monitoring would be used to evaluate impacts and potentially lead to additional mitigation measures, if required (30 CFR 585.633(b)). If the reported postconstruction bird and bat monitoring results indicate that bird and bat impacts deviate substantially from the impact analysis included in this EIS, then Revolution Wind would be required to recommend new mitigation measures or monitoring methods.

3.6 Benthic Habitat and Invertebrates (see section in main EIS)

3.7 Birds

3.7.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Birds

Geographic Analysis Area: The GAA for birds is the United States coastline from Maine to Florida (Figure 3.7-1). The offshore limit is 100 miles (160.9 km) from the Atlantic coast to capture the migratory movements of most species in this group. The onshore limit is 0.5 mile (0.8 km) inland from the Atlantic coast to cover onshore habitats used by the species that may be affected by offshore components of the Project as well as those species that could be affected by onshore Project components. The GAA was established to capture resident species and migratory species that winter as far south as South America and the Caribbean and those that breed in the Arctic or along the Atlantic coast that travel through the area.

Affected Environment: Table A.8.3-1 in Appendix A of the Vineyard Wind 1 final EIS (BOEM 2021a), the SFWF final EIS (BOEM 2021b), and COP Appendix AA (bri 2021), all incorporated here by reference, describe baseline conditions and the impacts, based on IPFs assessed, of ongoing and future activities other than offshore wind. These are further discussed below in the context of this Project. This section addresses potential impacts on bird populations that use inland, coastal, and offshore habitats, including both resident birds that use the Lease Area during all of (or portions of) the year and migrating birds with the potential to pass through the Lease Area during fall and/or spring migrations. Detailed information regarding species potentially present can be found in COP Appendix AA (bri 2021) and COP Appendix K (vhb 2021). Given the differences in life history characteristics and habitat use between offshore, inland, and coastal bird species, the sections below provide a separate discussion of each group. This section also discusses migratory birds as well as bald and golden eagles. In addition, this section addresses federally listed threatened and endangered species, but further information is provided in the Project BA prepared for the USFWS (BOEM 2022). Unless stated otherwise, special-status bird species are expected to be impacted similarly as described in general for other birds.

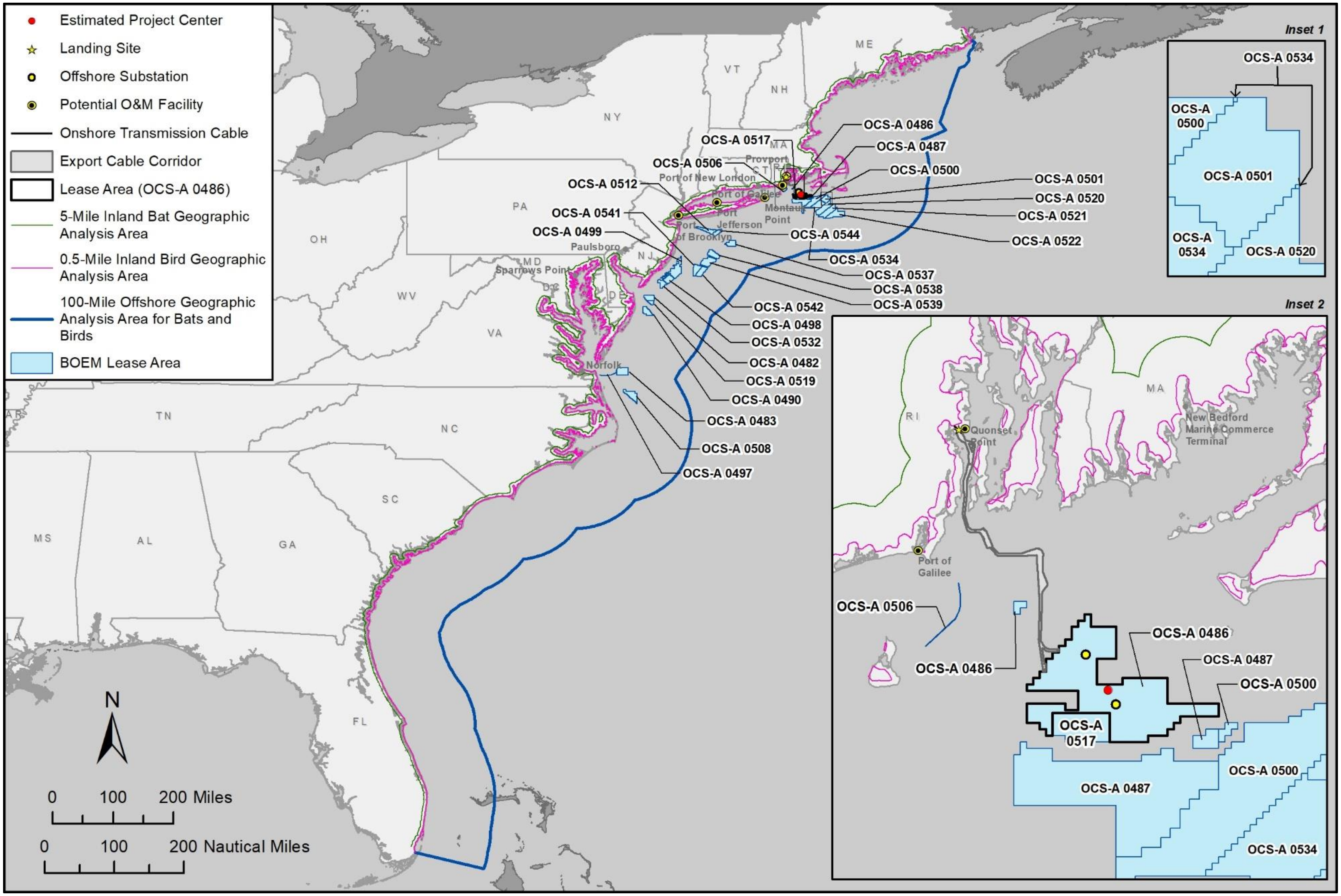

Figure 3.7-1. Geographic analysis area for birds.

Migrating Birds

The Atlantic Flyway, which follows the U.S. Atlantic coast, is an important migration route for many bird species moving from breeding grounds in New England and eastern Canada to winter habitats in North, Central, and South America. Bays, beaches, coastal forests, marshes, and wetlands provide important stopover and foraging habitat for migrating birds (MMS 2007). Both the onshore and offshore facilities associated with the Proposed Action are located within the Atlantic Flyway. Bird species using this flyway during spring and fall migrations have the potential to encounter proposed Project facilities. Despite the level of human development and activity present, the mid-Atlantic coast plays an important role in the ecology of many bird species. Chapter 4.2.9.3 of the Atlantic OCS EIS/EA (BOEM 2014a), incorporated here by reference, discusses the use of Atlantic coast habitats by migrating birds.

All native birds (except certain game birds protected under state laws) are protected under the Migratory Bird Treaty Act of 1918 (MBTA). The official list of migratory birds protected under the MBTA, and the international treaties that the MBTA implements, is found at 50 CFR 10.13. The MBTA makes it illegal to “take” migratory birds, their eggs, feathers, or nests.[1] Under Section 3 of Executive Order 13186, BOEM and the USFWS established an MOU on June 4, 2009, which identifies specific areas in which cooperation between the agencies would substantially contribute to the conservation and management of migratory birds and their habitats (MMS and USFWS 2009). The purpose of the MOU is to strengthen migratory bird conservation through enhanced collaboration between the agencies. One of the underlying tenets identified in the MOU is to evaluate potential impacts to migratory birds and design or implement measures to avoid, minimize, and mitigate such impacts as appropriate (MMS and USFWS 2009:Sections C, D, E(1), F(1–3, 5), G(6)).

Within the Atlantic Flyway, much of the bird migration activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several miles out onto the Atlantic OCS, whereas land birds tend to use a wider corridor extending from the coastline to tens of miles inland (Watts 2010). Although both groups may occur over land or water within the Atlantic Flyway and may extend considerable distances from shore, the highest diversity and density are centered on the shoreline. Migrating terrestrial species using the Atlantic Flyway may follow the coastline during migration or use more direct flight routes over expanses of open water. Many marine birds also make annual migrations up and down the eastern seaboard (e.g., gannet, loon, and sea ducks), taking them directly through the northeastern region in spring and fall. This results in a complex ecosystem where the community composition shifts regularly and where temporal and geographic patterns are highly variable. The region supports large populations of birds in summer, some of which breed in the area (e.g., coastal gulls and terns). Other summer residents (e.g., shearwaters and storm-petrels) visit from the Southern Hemisphere (where they breed during the austral summer). In the fall, many of the summer residents leave the area and migrate south to warmer regions and are replaced by species that breed farther north and winter in the northeastern region of the United States.

BOEM funds scientific studies and partners with the USFWS to better understand how migratory birds use the Atlantic OCS and to refine the understanding of the risks from development to migratory species (BOEM 2020). BOEM uses information from these studies, the USFWS, and the scientific literature to

[1] As described under 50 CFR 10.12, “Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.”

avoid leasing areas with high concentrations of migratory birds that are most vulnerable to offshore wind development. In addition, BOEM's stakeholder engagement during the delineation of the adjacent MA WEA resulted in the exclusion of 14 Atlantic OCS blocks that overlapped with high value sea duck habitat (BOEM 2013). BOEM worked with the USFWS to develop standard operating conditions for commercial leases and terms and conditions of plan approval that are intended to ensure that the potential for adverse impacts on birds is minimized. The standard operating conditions have been analyzed in recent EAs, consultations for lease issuance and site assessment activities, and BOEM's recent approval of the Virginia Offshore Wind Technology Advancement Project (BOEM 2015). Some of the standard operating conditions originated from BMPs in the ROD for the 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* (MMS 2007:Section 2.7). BOEM and the USFWS will continue to work with lessees to develop postconstruction plans (e.g., those developed for the Vineyard Wind 1 final EIS (BOEM 2021a) and the SFWF final EIS (BOEM 2021b) aimed at monitoring the effectiveness of mitigative measures considered necessary to minimize impacts to migratory birds with the flexibility to consider the need for modifications or additions to the measures.

Regional Offshore and Inland Birds

The Lease Area is located within the Mid-Atlantic Bight, an oceanic region spanning Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. A broad group of bird species may pass through the Lease Area and surrounding area, including migrants (e.g., raptors and songbirds), coastal birds (e.g., shorebirds, waterfowl, and waders), and marine birds (e.g., seabirds and sea ducks). See Table 3-1 in COP Appendix AA for a list of species that may pass through the Lease Area (bri 2021). A high diversity of marine birds uses the Lease Area because it is located at the northern end of the Mid-Atlantic Bight, which overlaps northern and southern species assemblages (bri 2021). Avian surveys were conducted within the Rhode Island Ocean Special Area Management Plan (OSAMP) study area, which included approximately 1,467 square miles (3,800 square kilometers [km^2]) with areas of the Block Island Sound, Rhode Island Sound, and the Atlantic continental shelf (Winiarski et al. 2012). Several methods were used to quantify the distributions and abundances of birds in the OSAMP study area, including land-based surveys, boat-based surveys, and aerial surveys. Survey data show that the use of these waters by coastal and marine birds is heaviest during winter months, peaking in early March to mid-April as birds prepare for and begin their spring migration. In general, coastal waters of less than 65.5 feet (20 m) in depth are important foraging habitat for diving ducks in winter, and nearshore shallow waters are important foraging habitat for locally breeding terns during summer months. Passerines use the air space during migration periods, and Block Island is an important stopover and resting spot for many species. Figures 3-7, 3-10, 3-12, and 3-13 in the Project's COP (bri 2021:Appendix AA) depict shorebirds; herons and egrets; songbirds; and coastal ducks, geese, swans, and grebes observed by season during OSAMP surveys, respectively.

The Marine-life Data and Analysis Team (MDAT) bird models (Curtice et al. 2019; Winship et al. 2018) describe regional-scale patterns of abundance with a range of environmental variables to produce long-term average annual and seasonal models. The MDAT Version 2 relative abundance and distribution models were produced for 47 bird species using U.S. Atlantic waters from Florida to Maine and thus provide an excellent regional context for local relative densities estimated from OSAMP surveys (see Part IV of COP Appendix AA) (bri 2021). Overall, the MDAT models indicate avian abundance is greater closer to shore than in the Lease Area (see Figure 3-6 in COP Appendix AA) (bri 2021).

A variety of passerines and other birds migrate along the Atlantic coast and could fly over the onshore facilities' locations. Although most of the U.S. coastline is disturbed from previous anthropogenic uses, there are several different key habitats present that are suitable to a range of wildlife species. Bird species observed during field investigations and a list of birds that could occur based on habitat preferences within the GAA are listed in Tables C-1 through C-3 in Appendix C in COP Appendix K (vhb 2021).

Overall, birds in the northeastern United States are subject to pressure from ongoing activities, particularly accidental releases of fuel/fluids/hazardous materials (hazmat), sediment, and/or trash and debris; new cable emplacement; interactions with fisheries and fishing gear; and climate change. More than one-third of bird species that occur in North America (37%, 432 species) are at risk of extinction unless significant conservation actions are taken (North American Bird Conservation Initiative [NABCI] 2016). This is likely representative of the conditions of birds within the GAA. The northeastern United States is also home to more than one-third of the human population of the nation. As a result, species that live or migrate through the Atlantic Flyway have historically been, and will continue to be, subject to a variety of ongoing anthropogenic stressors, including hunting pressure (approximately 86,000 sea ducks harvested annually [Roberts 2019]), commercial fisheries bycatch (approximately 2,600 seabirds killed annually on the Atlantic [Hatch 2017; Sigourney et al. 2019]), and climate change, all of which have the potential to adversely impact bird species. According to the NABCI, more than half of the offshore bird species (57%, 31 species) have been placed on the NABCI watch list because of their small ranges, small and declining populations, and threats to required habitats (NABCI 2016). Globally, monitored offshore bird populations have declined by nearly 70% from 1950 to 2010, which may be representative of the overall population trend of seabirds (Paleczny et al. 2015) that may forage, breed, and migrate over the Atlantic OCS. Overall, offshore bird populations are decreasing, although considerable differences in population trajectories of offshore bird families have been documented (NABCI 2016).

Coastal birds, especially those that nest in coastal marshes and other low-elevation habitats, are vulnerable to the rising sea level and the increasing frequency of strong storms due to global warming. According to the NABCI, nearly 40% of the more than 100 bird species that rely on coastal habitats for breeding or migration are on the NABCI watch list. Many of these coastal species have small population sizes and/or restricted distributions, resulting in an increased vulnerability to habitat loss/degradation and other stressors (NABCI 2016). These ongoing impacts on birds would continue regardless of the offshore wind industry. Some of the main drivers of bird population declines include habitat loss, habitat fragmentation, collisions with glass windows and power lines, invasive species, predators, toxic chemicals, and climate change (Mass Audubon 2011, 2013, 2017).

Avian exposure assessments for the Project were conducted for species-season combinations using MDAT and/or OSAMP data (bri 2021). To assess bird exposure at the local (i.e., MI/RI WEA) and regional scales (i.e., U.S. Atlantic waters), the Lease Area was compared to other similarly sized areas in each dataset for each season and species. Estimated exposure for each season and species was given a final score (see Table 3-4 in bri [2021]), which was categorized as minimal (a combined score of 0), low (combined score of 1–2), medium (combined score of 3–4), or high (combined score of 5–6). The exposure scores for each species and season, as well as the aggregated scores (e.g., the annual scores for each species and taxonomic group), should be interpreted as a measure of the relative importance of the Lease Area for a species/group, as compared to other surveyed areas in the region and in the northwest Atlantic. Qualitative exposure determinations were developed using the quantitative assessment of exposure (described above), other locally available data, existing literature, and species accounts. Maps showing the results of the exposure assessment can be found in Part VI of COP Appendix AA (bri 2021).

The Lease Area is generally far enough offshore as to be beyond the range of most breeding terrestrial or coastal bird species. Coastal birds that may forage in the Lease Area occasionally, visit the area sporadically, or pass through on their spring and/or fall migrations include shorebirds (e.g., sandpipers, plovers), waterbirds (e.g., cormorants, grebes), waterfowl (e.g., scoters, mergansers), wading birds (e.g., herons, egrets), raptors (e.g., falcons, eagles), and songbirds (e.g., warblers, sparrows). Overall, except for migratory falcons and songbirds, coastal birds are considered to have minimal exposure to the Lease Area. Falcons, primarily peregrine falcons (*Falco peregrinus*), may be exposed to the Lease Area. Of the marine birds, loons, sea ducks, gulls, terns, and auks received up to a medium overall exposure assessment. Some migratory songbirds, particularly blackpoll warblers (*Setophaga striata*), may also be exposed to the Lease Area during fall migration (bri 2021).

Special-Status Species

Three bird species listed under the ESA are present in the region: piping plover (*Charadrius melodus*) (threatened), red knot (*Calidris canutus rufa*) (threatened), and roseate tern (*Sterna dougallii*) (endangered). The Atlantic population of piping plover nests on beaches in the northeastern U.S. coastal region and will also migrate (spring and fall) through the Lease Area to and from breeding sites. Red knots winter in southern states or in Central or South America and may pass through the Lease Area during migration (spring and fall) in transit to and from Arctic breeding sites. Roseate terns also migrate through the Lease Area in the spring and fall on their way to and from breeding sites in New York, the New England states, and Atlantic Canada. BOEM has prepared a BA to address Project effects to federally listed species under the jurisdiction of the USFWS, pursuant to Section 7 of the ESA (BOEM 2022). The BA also provides detailed accounts for each of these species.

To assess if any special-status species have the potential to occur in the onshore portion of the Lease Area, information from the Rhode Island Department of Environmental Management (DEM) Environmental Resource Map (ERM) was evaluated and an official species list from the USFWS IPaC tool was generated on September 28, 2019, regarding the landfall envelope, the onshore transmission cable routes, the OnSS, and the interconnection cable route (vhb 2021). vhb utilized the IPaC tool to generate lists of bird species protected under the MBTA that have been designated as Birds of Conservation Concern (BCC) by the USFWS within the proposed limits of the onshore facilities during development of the *Onshore Natural Resources and Biological Assessment* (vhb 2021). BCC are those species that without additional conservation actions are likely to become candidates for listing under the ESA (USFWS 2021). Table 4 in Appendix K of the COP (vhb 2021) provides the list of BCC with the potential to occur within the limits of the onshore facilities and indicates which of these species were observed during field investigations. According to the Rhode Island DEM ERM, there are no records of state-listed species within the GAA (vhb 2021). Migratory bird species with potential to occur near proposed onshore facilities are also presented in Table 4 of COP Appendix K (vhb 2021).

Bald and Golden Eagles

Eagles have additional federal protection (besides under the MBTA) under the Bald and Golden Eagle Protection Act. The general morphology of both bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) dissuades long-distance movements in offshore settings (Kerlinger 1985).

These two species generally rely upon thermal formation, which develops poorly over the open ocean, during long-distance movements. The bald eagle is present year-round in Massachusetts and Rhode Island, and its numbers have been slowly increasing over approximately the last 30 years. They are rarely observed in offshore surveys (Williams et al. 2015; all observations < 3.7 miles [6 km] from shore), which supports the notion that bald eagles do not venture far from land. Although bald eagles could be present near the proposed onshore facilities and would most likely be present in late April, no bald eagles were observed during field investigations (vhb 2021). Bald and golden eagles are not expected to occur within the Lease Area, but some potential exists for effects (e.g., displacement due to noise, habitat loss/modification, and injury/mortality due to contact with construction equipment) resulting from the construction and installation, O&M, and decommissioning of the onshore facilities.

3.7.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential bird impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

<u>Accidental releases and discharges:</u> Future offshore wind and non-wind activities could expose coastal offshore waters to contaminants (e.g., fuel, sewage, solid waste, or chemicals, solvents, oils, or grease from equipment) in the event of a spill or release during routine vessel use. Ingestion of hard and soft plastic debris could lead to blockages and could result in adverse health effects to birds, such as decreased hematological function, dehydration, drowning, hypothermia, starvation, weight loss, and even death (Briggs et al. 1997; Haney et al. 2017; Paruk et al. 2016). Vessel compliance with USCG regulations would minimize trash or other debris; therefore, BOEM expects accidental trash releases from offshore wind vessels to be rare. Spills could result in small exposures that cause oiling of feathers that can lead to adverse effects such as changes in flight efficiencies and result in increased energy expenditure during daily and seasonal activities (Maggini et al. 2017). All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and BSEE. OSRPs are required for each project and would provide for rapid spill response, cleanup, and other measures that would help to minimize potential impacts on affected resources from spills. WTGs and OSSs are generally self-contained and would not generate discharge (see COP Appendix D). Vessels would also have onboard containment measures that would further reduce the impact of a spill in the event of an allision or collision. Based on the low risk of spills from vessels due to implementation of safe handling, storage, and cleanup procedures, impacts from accidental spills and trash would represent a **negligible** adverse impact to birds.

<u>Anchoring and new cable emplacement/maintenance:</u> A small amount of infrequent construction impacts associated with onshore power infrastructure would be required over the next 6 to 10 years to tie future offshore wind energy projects to the electric grid. Typically, this would require only small amounts of habitat removal, if any, and would occur primarily in previously disturbed areas. Up to 23,745 acres of localized temporary seafloor disturbance and associated increased suspended sedimentation could occur during construction of proposed wind farm cables (see Table E-4 in Appendix E). Where future offshore wind activities overlap the GAA, there would be increased anchoring of vessels during survey activities and during the construction and installation, O&M, and decommissioning of offshore components. In addition, there could be increased anchoring/mooring of meteorological (met) towers or buoys. Disturbed seafloor from construction of future offshore wind projects and anchoring may affect diving birds'

foraging success or may affect some prey species (e.g., benthic assemblages); however, impacts would be temporary and localized, and birds would be able to successfully forage in adjacent areas and would not be affected by increased suspended sediments and no population-level impacts would occur. Suspended sediment concentrations during activities other than dredging would be within the range of natural variability for this location. Therefore, adverse impacts would be **minor**. See Sections 3.6 and 3.13 for detailed information on potential effects to benthic habitat.

Climate change: Impacts associated with climate change (i.e., increased storm severity and frequency, ocean acidification, altered migration patterns, increased disease frequency, habitat conversion, and increased erosion and sediment deposition) could result in long-term **minor** adverse risks to birds and could lead to changes in prey abundance and distribution, changes in nesting and foraging habitat abundance and distribution, and changes to migration patterns and timing. During construction, future offshore wind development activities may result in a small temporary increase in greenhouse gas (GHG) emissions (see Section 3.4.2.2.2). However, operation of these projects may beneficially contribute to a broader combination of actions to reduce future impacts to birds from climate change over the long term due to reduced reliance on fossil fuel–generated energy sources.

Light: Nighttime lighting associated with offshore structures and vessels could also represent a source of bird attraction. Under the No Action Alternative, offshore WTGs and OSSs would have hazard and aviation lighting that would be added beginning in 2021 and continuing through 2027 (see Table E1-3 in Appendix E1). Construction vessels are also a source of artificial lighting. Vessel lighting would be temporary and result in a **minor** adverse impact to birds; structure lighting may pose an increased collision or predation risk (Hüppop et al. 2006), although this risk would be localized in extent and minimized using BOEM lighting guidelines (BOEM 2021c; Kerlinger et al. 2010), and therefore would also be a **minor** adverse impact.

Noise: Table E-3 in Appendix E indicates that multiple offshore wind project construction periods are anticipated between 2022 and 2027. Construction noise sources will include, most notably, pile driving as well as geological and geophysical surveys, offshore and onshore construction, and aircraft and vessel traffic. These would create noise and may temporarily impact some bird species by displacing them and changing their behavior. Noise generated by construction equipment also has the potential to mask signals used by certain bird species for communication and mating, as well as hunting, which can lead to a decrease in bird density in the affected area (Bottalico et al. 2015). Potential impacts could be greater if avoidance and displacement of birds occur during seasonal migration periods. Noise transmitted through water could temporarily displace diving birds in a limited space around each pile and could cause short-term stress and behavioral changes ranging from mild annoyance to escape behavior (BOEM 2014b, 2016). Vessel and aircraft noise could also disturb some individual diving birds, but they would acclimate to the noise or move away, potentially resulting in temporary displacement. Collectively, these noise sources would be temporary and localized, resulting in a **minor** adverse impact to these birds.

Presence of structures: Onshore land development or port expansion activities could result in limited loss of nesting and/or foraging habitat for some bird species. The presence of offshore structures can lead to impacts, both beneficial and adverse, on birds through fish aggregation and the associated increase in foraging opportunities as well as entanglement and gear loss/damage, migration disturbances, and WTG strikes and displacement. These impacts may arise from buoys, met towers, foundations, scour/cable protections, and transmission cable infrastructure.

The primary threat to birds from the presence of structures would be from collision with WTGs. Birds are susceptible to collision with structures, particularly at night and/or during other periods of low visibility (e.g., rain or fog) (Stantec 2018). As discussed above, the Atlantic Flyway is an important migratory pathway for up to 164 species of waterbirds, and a similar number of land birds, with the greatest volume of birds using the Atlantic Flyway during annual migrations between wintering and breeding grounds (Watts 2010). As discussed in BOEM (2012), 55 bird species could encounter operating WTGs on the Atlantic OCS. However, the abundance of birds that overlap with the anticipated development of wind energy facilities on the Atlantic OCS is relatively small (Curtice et al. 2019; Winship et al. 2018). Of 55 bird species, 47 have sufficient survey data to calculate the modeled percentage of a species population that would overlap with the anticipated offshore wind development on the Atlantic OCS (Winship et al. 2018); the relative seasonal exposure is generally very low, ranging from 0.0% to 5.2% (Table 3.7-1). BOEM assumes that the 47 species (85%) with sufficient data to model the relative distribution and abundance are representative of the 55 species that may overlap offshore wind development on the Atlantic OCS.

Table 3.7-1. Percentage of Atlantic Seabird Populations that Overlap with Anticipated Offshore Wind Energy Development on the Outer Continental Shelf by Season

Species	Spring	Summer	Fall	Winter
Artic tern (*Sterna paradisaea*)	N/A	0.2%	N/A	N/A
Atlantic puffin (*Fratercula arctica*)	0.2%	0.1%	0.1%	0.2%
Audubon shearwater (*Puffinus lherminieri*)	0.0%	0.0%	0.0%	0.0%
Black-capped petrel (*Pterodroma hasitata*)	0.0%	0.0%	0.0%	0.0%
Black guillemot (*Cepphus grille*)	N/A	0.3%	N/A	N/A
Black-legged kittiwake (*Rissa tridactyla*)	0.7%	N/A	0.7%	0.5%
Black scoter (*Melanitta americana*)	0.2%	N/A	0.4%	0.5%
Bonaparte’s gull (*Chroicocephalus philadelphia*)	0.5%	N/A	0.4%	0.3%
Brown pelican (*Pelecanus occidentalis*)	0.1%	0.0%	0.0%	0.0%
Band-rumped storm-petrel (*Oceanodroma castro*)	N/A	0.0%	N/A	N/A
Bridled tern (*Onychoprion anaethetus*)	N/A	0.1%	0.1%	N/A
Common eider (*Somateria mollissima*)	0.3%	0.1%	0.5%	0.6%
Common loon (*Gavia immer*)	3.9%	1.0%	1.3%	2.1%
Common murre (*Uria aalge*)	0.4%	N/A	N/A	1.9%
Common tern (*Sterna hirundo*)	2.1%	3.0%	0.5%	N/A
Cory’s shearwater (*Calonectris borealis*)	0.1%	0.9%	0.3%	N/A
Double-crested cormorant (*Phalacrocorax auritus*)	0.7%	0.6%	0.5%	0.4%
Dovekie (*Alle alle*)	0.1%	0.1%	0.3%	0.2%
Great black-backed gull (*Larus marinus*)	1.3%	0.5%	0.7%	0.6%

Species	Spring	Summer	Fall	Winter
Great shearwater (*Puffinus gravis*)	0.1%	0.3%	0.3%	0.1%
Great skua (*Stercorarius skua*)	N/A	N/A	0.1%	N/A
Herring gull (*Larus argentatus*)	1.0%	1.3%	0.9%	0.5%
Horned grebe (*Podiceps auritus*)	N/A	N/A	N/A	0.3%
Laughing gull (*Leucophaeus atricilla*)	1.0%	3.6%	0.9%	0.1%
Leach's storm-petrel (*Oceanodroma leucorhoa*)	0.1%	0.0%	0.0%	N/A
Least tern (*Sternula antillarum*)	N/A	0.3%	0.0%	N/A
Long-tailed duck (*Clangula hyemalis*)	0.6%	0.0%	0.4%	0.5%
Manx shearwater (*Puffinus puffinus*)	0.0%	0.5%	0.1%	N/A
Northern fulmar (*Fulmarus glacialis*)	0.1%	0.2%	0.1%	0.2%
Northern gannet (*Morus bassanus*)	1.5%	0.4%	1.4%	1.4%
Parasitic jaeger (*Stercorarius parasiticus*)	0.4%	0.5%	0.4%	N/A
Pomarine jaeger (*Stercorarius pomarinus*)	0.1%	0.3%	0.2%	N/A
Razorbill (*Alca torda*)	5.2%	0.2%	0.4%	2.1%
Ring-billed gull (*Larus delawarensis*)	0.5%	0.5%	0.9%	0.5%
Red-breasted merganser (*Mergus serrator*)	0.5%	N/A	N/A	0.7%
Red phalarope (*Phalaropus fulicarius*)	0.4%	0.4%	0.2%	N/A
Red-necked phalarope (*Phalaropus lobatus*)	0.3%	0.3%	0.2%	N/A
Roseate tern (*Sterna* dougallii)	0.6%	0.0%	0.5%	N/A
Royal tern (*Thalasseus maximus*)	0.0%	0.2%	0.1%	N/A
Red-throated loon (*Gavia stellate*)	1.6%	N/A	0.5%	1.0%
Sooty shearwater (*Ardenna grisea*)	0.3%	0.4%	0.2%	N/A
Sooty tern (*Onychoprion fuscatus*)	0.0%	0.0%	N/A	N/A
South polar skua (*Stercorarius maccormicki*)	N/A	0.2%	0.1%	N/A
Surf scoter (*Melanitta perspicillata*)	1.2%	N/A	0.4%	0.5%
Thick-billed murre (*Uria lomvia*)	0.1%	N/A	N/A	0.1%
Wilson's storm-petrel (*Oceanites oceanicus*)	0.2%	0.9%	0.2%	N/A
White-winged scoter (*Melanitta deglandi*)	0.7%	N/A	0.2%	1.3%

Source: Calculated from Winship et al. (2018).

Notes: N/A = not applicable.

The primary operational impact to bird resources would be collision with turbines. In the contiguous United States, bird collisions with operating WTGs are believed to be a relatively rare event, with an estimated 140,000 to 328,000 (mean = 234,000) birds killed annually by 44,577 onshore turbines (Loss et al. 2013). Robinson Willmott et al. (2013) evaluated the sensitivity of bird resources to collision and/or displacement due to future wind development on the Atlantic OCS and included the 164 species selected by Watts (2010) plus an additional 13 species, for a total of 177 species that may occur on the Atlantic OCS from Maine to Florida during all or some portion of the year. As discussed in Robinson Willmott et al. (2013), species populations with high scores for sensitivity for collision include gulls, jaegers, and the northern gannet (*Morus bassanus*). In many cases, high collision sensitivity was driven by high occurrence on the Atlantic OCS, low avoidance rates with high uncertainty, and time spent in the RSZ. Many of the species addressed in Robinson Willmott et al. (2013) that had low collision sensitivity include migrating passerines that typically fly above the RSZ. As discussed in BOEM (2012), 55 species may be expected to have some level of potential overlap with the WEA and could encounter operating WTGs on the Atlantic OCS. However, generally the abundance of bird species that overlap with the anticipated development of wind energy facilities on the Atlantic OCS is relatively small. As described above, of the 177 species that may occur along the Atlantic coast, 55 are likely to encounter WTGs associated with offshore wind development. Of these, there are a total of 47 marine bird species with sufficient survey data to calculate the modeled percentage of a species population that would overlap with the anticipated offshore wind development on the Atlantic OCS (Winship et al. 2018); the relative seasonal exposure is generally very low, ranging from 0.0% to 5.2% (see Table 3.7-1). BOEM assumes that the 47 species (85%) with sufficient data to model the relative distribution and abundance on the Atlantic OCS are representative of the 55 species that may overlap with offshore wind development on the Atlantic OCS.

Additionally, with the proposed 1-nm (1.9-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 Atlantic OCS would encounter WTGs, with most flying above or below spinning turbines. Further, the spacing between turbines would likely permit birds to fly through individual lease areas without changing course or only making minor course corrections to avoid operating WTGs. Course corrections made to avoid a wind energy facility could result in exposure to one or more additional wind energy facilities within the GAA, but again, the 1-nm spacing would allow for migrating individuals to make only small course correction, if any, to avoid operating WTGs. Course corrections made by migratory birds to avoid a project or individual WTG would be relatively minor when compared to the distances traveled during seasonal long-distance migrations. Adverse impacts of additional energy expenditure due to minor course corrections or complete avoidance of lease areas would not be expected to be biologically significant, and no population-level effects would be expected. Therefore, these adverse impacts would be **minor**.

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, substantial foraging habitat for resident birds would remain available. Further, a recent study of long-term data collected in the North Sea found that despite the extensive observed displacement of loons in response to the development of 20 wind farms, there was no decline in the region’s loon population (Vilela et al. 2021).

The presence of new structures could result in increased prey items for some marine bird species. WTG foundations could increase the mixing of surface waters and deepen the thermocline, possibly increasing pelagic productivity in local areas (English et al. 2017). The new structures may also create habitat for structure-oriented and/or hard-bottom species. This reef effect has been observed around WTGs, leading to local increases in biomass and diversity (Causon and Gill 2018). Invertebrate and fish assemblages may develop around these reef-like elements within the first year or two after construction (English et al. 2017). Although some studies have noted increased biomass and increased production of particulate organic matter by epifauna growing on submerged foundations, it is not clear to what extent the reef effect results in increased productivity versus simply attracting and aggregating fish from the surrounding areas (Causon and Gill 2018). Recent studies have found increased biomass for benthic fish and invertebrates, and possibly for pelagic fish, marine mammals, and birds as well (Pezy et al. 2018; Raoux et al. 2017; Wang et al. 2019), indicating that offshore wind energy facilities can generate beneficial permanent impacts on local ecosystems, translating to increased foraging opportunities for individuals of some marine bird species. BOEM anticipates that the presence of structures may result in permanent beneficial impacts. Conversely, increased foraging opportunities could attract marine birds, potentially exposing those individuals to increased collision risk associated with operating WTGs. Therefore, these impacts would be **minor** adverse.

3.7.1.2 Conclusions

Under the No Action Alternative, birds would continue to follow the current general trends and respond to current and future environmental and societal activities. Although the Project would not be built as proposed under the No Action Alternative, ongoing activities (e.g., commercial fisheries) and future offshore wind development would continue to have temporary to permanent adverse impacts (e.g., disturbance, displacement, injury, mortality, habitat degradation, habitat conversion) on birds primarily through accidental releases, anthropogenic noise, traffic, presence of structures, and climate change. In addition to ongoing activities, the impacts of planned actions other than offshore wind development, including new submarine cables and pipelines, increasing onshore construction, marine minerals extraction, port expansions, and the installation of new structures on the Atlantic OCS, would be **minor** adverse. The combination of ongoing activities and reasonably foreseeable activities other than offshore wind would result in **minor** adverse impacts on birds in the GAA.

Considering all the IPFs together, the overall impacts associated with offshore wind activities in the GAA would result in **minor** adverse impacts to birds. Most of the offshore structures in the GAA would be attributable to offshore wind development. Migratory birds that use the offshore WEAs during all or parts of the year would either be exposed to new collision risk or would have long-term functional habitat loss due to behavioral avoidance and displacement from WEAs on the Atlantic OCS. The offshore wind development would also be responsible for most of the impacts related to new cable emplacement and pile-driving noise, but impacts on birds resulting from these IPFs would be localized and temporary and would not be biologically significant.

The No Action Alternative would forgo postconstruction avian monitoring for migratory birds and ESA-listed species and annual mortality reporting, the results of which could contribute to an improved understanding of the effects of offshore wind development, benefit the future management of these species, and inform planning of other offshore development. However, ongoing and future surveys and monitoring could still supply similar data.

3.7.2 Environmental Consequences

3.7.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

This assessment analyzes the maximum-case scenario; however, there is the potential for variances in the proposed Project build-out, as defined in the PDE (see Appendix D). The Project design parameters that would influence the magnitude of the impacts on bats include the number, size, and location of WTGs; the location of the OnSS and ICF; the type of lighting to be used; the location of construction within the landfall work area and within the transmission cable envelope; and the time of year during which construction occurs. Impacts associated with construction of onshore elements of the Proposed Action during the breeding season for birds could be avoided if onshore construction occurs outside of this time frame.

The following EPMs would be implemented to minimize potential impacts to birds:

- Revolution Wind evaluated siting alternatives for the OnSS using the criteria that included avoidance or minimization of disturbance to ecologically sensitive areas.
- The OnSS and ICF would be located on parcels that are already highly altered and include buried demolition waste.
- The transmission cable would be located primarily in unvegetated and previously disturbed or developed ROWs.

These EPMs would be implemented across all alternatives; therefore, BOEM would not expect measurable potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for birds across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Table E1-3 in Appendix E1. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

Table 3.7-2 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action.

The Conclusion section within each alternative analysis discussion includes rationale for the effects determinations.

The overall impact to birds from any action alternative would be **minor** adverse, as the effects would be small, and the resource would recover completely, with no mitigating action required.

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Table 3.7-2. Alternative Comparison Summary for Birds

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Accidental releases and discharges	Future offshore wind and non-wind activities could expose coastal offshore waters to contaminants (e.g., fuel, sewage, solid waste, or chemicals, solvents, oils, or grease from equipment) in the event of a spill or release during routine vessel use. Vessel compliance with USCG regulations would minimize trash or other debris; therefore, BOEM expects accidental trash releases from offshore wind vessels to be rare. All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and BSEE. OSRPs are required for each project and would provide for rapid spill response, cleanup, and other measures that would help to minimize potential impacts on affected resources from spills. Based on the low risk of spills from vessels due to implementation of safe handling, storage, and cleanup procedures, impacts from accidental spills and trash would represent a **negligible** adverse impact to birds.	**Offshore**: Potential adverse impacts to birds from contaminant discharges or releases or from improper disposal of trash or debris during construction would be avoided or minimized with adherence to federal, state, and local regulations regarding disposal of solid and liquid wastes, resulting in short-term **negligible** to **minor** adverse impacts. Accidental releases, if any, would occur infrequently at discrete locations and vary widely in space and time; for this reason, BOEM expects localized and temporary **negligible** adverse impacts on birds. Impacts to birds from this IPF during operation and decommissioning of the offshore facilities would be similar to offshore construction impacts and result in short-term **negligible** to **minor** adverse impacts with compliance with USCG requirements and BSEE regulations. In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be likely limited in extent and duration and would result in localized and temporary **negligible** adverse cumulative impacts on birds.	**Offshore**: Alternatives C through F would reduce the number of WTGs, potentially resulting in a reduced amount of offshore construction equipment and vessels required, thereby resulting in a negligible decreased risk for accidental releases and discharges. However, no measurable change from Proposed Action construction impacts to birds from this IPF is anticipated, which are expected to be localized and temporary **negligible** to **minor** adverse. Impacts to birds from this IPF during operation and decommissioning of the offshore facilities are expected to be similar to offshore construction impacts, and no measurable change from Proposed Action construction impacts to birds from this IPF is anticipated, which are expected to be **negligible** to **minor** adverse. Future offshore wind activities would contribute to an increased risk of spills and associated impacts due to fuel, fluid, or hazmat exposure. The contribution from future offshore wind and Alternatives C through F would be a low and non-measurable percentage of the overall spill risk from ongoing activities. In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including Alternatives C through F, would be likely limited in extent and duration of a release and result in localized and temporary **negligible** adverse cumulative impacts to birds.			
		Onshore: Onshore, construction and HDD activities could result in the accidental releases of fuel, fluids, or hazmat; sediment; and/or trash and debris. Based on the low risk of spills due to implementation of safe handling, storage, and cleanup procedures, impacts from accidental spills and trash would represent a localized and temporary **negligible** adverse impact to birds. The OnSS would require various oils, fuels, and lubricants to support its operation. Accidental discharges, releases, and disposal could indirectly cause bird habitat degradation; however, risks would be avoided through spill prevention and control measures and associated BMPs. Therefore, potential adverse impacts associated with discharges and releases are considered short term and localized **negligible** adverse. In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be localized and temporary due to the likely limited extent and duration of a release and result in **negligible** adverse cumulative impacts to birds.	**Onshore**: Alternatives C through F would not alter impacts to onshore activities; therefore, impacts would be the same as those described for the Proposed Action: temporary to short term **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Anchoring and new cable emplacement/ maintenance	A small amount of infrequent construction impacts associated with onshore power infrastructure would be required over the next 6 to 10 years to tie future offshore wind energy projects to the electric grid. Typically, this would require only small amounts of habitat removal, if any, and would occur primarily in previously disturbed areas. Where future offshore wind activities overlap the GAA, there would be increased anchoring of vessels during survey activities and during the construction and installation, O&M, and decommissioning of offshore components. Disturbed seafloor from construction of future offshore wind projects and anchoring may affect diving birds' foraging success or may affect some prey species (e.g., benthic assemblages); however, impacts would be temporary and localized, and birds would be able to successfully forage in adjacent areas and would not be affected by increased suspended sediments and no population-level impacts would occur. Therefore, adverse impacts would be **minor**.	**Offshore**: Seafloor disturbed by cable installation and dredging prior to cable installation would result in turbidity effects that could reduce marine bird foraging success or have temporary and localized impacts on marine bird prey species. Vessel anchoring during construction would also result in increased turbidity. Individual birds would successfully forage in nearby areas not affected by increased turbidity/sedimentation during anchoring and cable emplacement, and only nonmeasurable **negligible** adverse impacts, if any, on individuals or populations would be expected given the localized and temporary nature of construction activities. Other than temporary increases in turbidity from seafloor disturbance due to occasional vessel anchoring, no impacts to bird species are anticipated during the O&M phase for the offshore RWF or RWEC. Impacts from decommissioning would be similar to construction impacts unless the RWEC is abandoned in place: **negligible** adverse. In the context of reasonably foreseeable environmental trends, the combined cable emplacement impacts from ongoing and planned actions, including the Proposed Action, could occur if impacts are in close temporal and spatial proximity. However, these adverse impacts from anchoring and cable emplacement would be **negligible** and would not be biologically significant. For these reasons, the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** cumulative adverse impacts to birds.	**Offshore**: Alternatives C through F would reduce the number of WTG foundations and IACs. Reduced habitat disturbance from foundation and IAC installation could negligibly decrease turbidity that could alter the behavior of bird species. Therefore, BOEM would expect a similar but lower impact to birds than the Proposed Action: temporary, lasting up to 12 hours, localized and nonmeasurable **negligible** adverse impacts. Similar to the Proposed Action, no impacts to bird species are anticipated during the O&M phase for the offshore RWF or RWEC. Impacts from decommissioning would be similar to construction impacts unless the RWEC is abandoned in place: **negligible** adverse. Alternatives C through F would add 5,864 to 6,665 acres of seafloor disturbance from operation of WTG foundations and scour protection, the RWEC and IAC installation, and anchoring to the No Action Alternative, which represents up to 28% of the total seafloor disturbance estimated under the No Action Alternative. This would result in localized turbidity effects that could reduce marine bird foraging success or impact marine bird prey species. However, individual birds would be expected to successfully forage in nearby areas not affected by increased turbidity, and only nonmeasurable negligible impacts, if any, on individuals or populations would be expected given the localized and temporary nature of the potential impacts. In the context of reasonably foreseeable environmental trends, the combined cable emplacement and anchoring impacts from ongoing and planned actions, including Alternatives C through F, could occur if impacts are in close temporal and spatial proximity. However, these adverse impacts from anchoring and cable emplacement would be negligible and would not be biologically significant. For these reasons, these alternatives in combination with other past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** adverse cumulative impacts to birds.			
		Onshore: Land disturbance and habitat alteration resulting from construction within the landfall work area may result in the direct injury or mortality of bird species. Mitigations like observing time-of-year restrictions on vegetation removal would avoid the breeding season of birds, thus reducing the likelihood of injury and/or mortality from construction activities. Therefore, the impacts (e.g., injury and/or mortality) resulting from land disturbance and habitat alteration would be temporary **negligible** adverse. Additionally, construction work within the landfall work area would occur largely outside of the breeding period of listed species that might nest in the area, and because use of the shoreline by shorebirds within the landfall work area has not been documented (vhb 2021), onshore impacts for listed species from land disturbance would also be **negligible** adverse. Onshore transmission cable installation would also result in temporary ground disturbance. Most of the temporary ground disturbance would occur in previously disturbed areas along paved roads or parking lots and would not result in impacts to bird habitat. Operation of the onshore transmission cable would pose no risk to birds because it would be buried. Land disturbance in the form of vegetation management would occur on a periodic basis to maintain vegetation at shrub height within the perimeters of the onshore facilities. Land disturbance as it relates to vegetation clearing may	**Onshore**: Alternatives C through F would not alter impacts to onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
		result in the direct injury or mortality of birds. However, mortality and injury impacts would be mitigated by observing time-of-year restrictions on vegetation removal that would avoid the breeding season of bird species. Therefore, the adverse impacts resulting from this IPF would be **negligible**. The contribution of the Proposed Action on adverse cumulative impacts to birds from new cable emplacement or maintenance in the context of reasonably foreseeable onshore environmental trends within the GAA is expected to be **negligible** adverse.				
Climate change	Impacts associated with climate change (i.e., increased storm severity and frequency, ocean acidification, altered migration patterns, increased disease frequency, habitat conversion, and increased erosion and sediment deposition) could result in long-term **minor** adverse risks to birds and could lead to changes in prey abundance and distribution, changes in nesting and foraging habitat abundance and distribution, and changes to migration patterns and timing. However, future offshore wind development activities may beneficially contribute to a broader combination of actions to reduce future impacts to birds from climate change over the long term due to reduced reliance on fossil fuel–generated energy sources.	**Offshore**: Construction of the offshore facilities would result in a small temporary increase in GHG emissions within the GAA during the construction phase. As a result, adverse impacts to birds from construction of the Proposed Action associated with climate change would be short term **negligible** adverse. The expected impacts on climate change from operation of the offshore facilities alone would not result in a measurable increase in the adverse impacts to birds beyond those described under the No Action Alternative. In addition, operation of the Proposed Action could also contribute to a long-term net decrease in GHG emissions, but this change would likely not be measurable. Therefore, BOEM expects the impacts from the Proposed Action on climate change would be long term **negligible**. The types of impacts from global climate change described for the No Action Alternative would occur under the Proposed Action. Therefore, long-term **minor** adverse and long-term **negligible** beneficial cumulative impacts to birds are expected.	**Offshore**: Alternatives C through F would reduce the number of WTGs, potentially resulting in a reduced number of GHG-emitting construction vessels and/or aircraft. However, no measurable change from Proposed Action construction impacts to birds from this IPF is anticipated, which are expected to be short term **negligible** adverse. Likewise, no measurable change from Proposed Action operational impacts to birds is anticipated, which are expected to be long term **negligible** adverse. The types of impacts from global climate change described for the No Action Alternative would occur under Alternatives C through F. However, Alternatives C through F could also contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce climate change impacts. Therefore, long-term **minor** adverse and long-term **negligible** beneficial cumulative impacts to birds are expected.			
		Onshore: Onshore impacts to birds associated with climate change from construction and decommissioning of the Proposed Action would be similar to those discussed above for offshore facilities and activities: short term **negligible** adverse. No measurable climate change impacts to birds from O&M of the onshore facilities are expected. Therefore, the adverse impacts from this IPF are expected to be long term **negligible** adverse. The types of impacts from global climate change described for the No Action Alternative would occur under the Proposed Action. Therefore, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action and cumulative impacts, are expected to be long term **minor** adverse.	**Onshore**: The Habitat Alternative would not alter impacts to onshore activities; therefore, construction and operational impacts would be the same as those described for the Proposed Action: short term to long-term **negligible** adverse. Cumulative impacts would also be the same as those described for the Proposed Action: long term **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Light	Nighttime lighting associated with offshore structures and vessels could represent a source of bird attraction. Vessel lighting would be temporary and result in a **minor** adverse impact to birds; structure lighting may pose an increased collision or predation risk (Hüppop et al. 2006), although this risk would be localized in extent and minimized using BOEM lighting guidelines (BOEM 2021c; Kerlinger et al. 2010), and therefore would also be a **minor** adverse impact.	**Offshore**: Lighting used during construction would be limited to the minimum required for safety during construction activities to minimize potential impacts. Therefore, adverse impacts to birds from lighting during construction would be localized and temporary **negligible** to **minor** adverse. Under the Proposed Action, up to 100 WTGs and up to two OSSs would be lit with USCG navigational and FAA hazard lighting. These lights have some potential to attract birds and result in increased collision risk (Hüppop et al. 2006). However, the mandatory use of red flashing aviation obstruction lights and the avoidance of any steady-burning aviation obstruction lights are expected to minimize bird attraction and therefore collision risk (Kerlinger et al. 2010; Orr et al. 2016). For this reason, BOEM expects adverse impacts, if any, to be long term **negligible** adverse from offshore lighting. Ongoing and future non–offshore wind activities are expected to cause short-term impacts, primarily from vessel lights. For these reasons, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** adverse cumulative impacts to birds, and no individual or population-level impacts would be expected.	**Offshore**: Although the number and duration of construction vessels and work areas requiring nighttime lighting could be slightly reduced under Alternatives C through F, no measurable change from Proposed Action construction impacts to birds is anticipated, which are expected to be localized and temporary **negligible** to **minor** adverse. Alternatives C through F would reduce nighttime lighting, thereby negligibly decreasing the risk of avian injury or mortality from collision with WTGs as compared to the Proposed Action, and impacts are expected to be long term **negligible** adverse. Alternatives C through F would add 56 to 93 new WTGs with red flashing aviation hazard lighting to the No Action Alternative; these lights could attract birds and result in increased collision risk (Hüppop et al. 2006). Additionally, marine navigation lighting would include one or more flashing white lights on each WTG and the OSSs and would be directed out and down to the water surface. Vessel lights during construction and installation, O&M, and decommissioning would be minimal and limited to vessels transiting to and from wind farm areas. Ongoing and future non–offshore wind activities are expected to cause short-term impacts, primarily from vessel lights. For these reasons, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** cumulative adverse impacts to birds because no individual or population-level impacts would be expected.			
		Onshore: Most of the onshore construction would occur during the daylight hours, although some overnight lighting may occasionally be necessary during construction of the onshore facilities. However, this is not expected to have a measurable effect on bird behavior, therefore BOEM anticipates temporary **negligible** adverse impacts to birds. During the O&M of the OnSS and ICF, yard lighting would be used for assessment of equipment. Most decommissioning activities would occur during the day, and overnight lighting would only be necessary if there is work in progress on-site or lights are left on for safety and security purposes. Therefore, the adverse impacts resulting from this IPF would be long term **negligible**. Ongoing and future onshore activities could contribute to impacts to birds from light if they occur at the same time within the GAA. However, these effects are also expected to be localized and temporary and would not contribute to adverse cumulative impacts to birds in the GAA.	**Onshore**: Alternatives C through F would not alter impacts to onshore activities; therefore, construction and operational impacts would be the same as those described for the Proposed Action: temporary to long-term **negligible** adverse. Cumulative impacts would also be the same as those described for the Proposed Action: localized and temporary **negligible** to **minor** adverse.			

<table>
<tr><th>Impact-Producing Factor</th><th>No Action Alternative</th><th>Alternative B (Proposed Action)
up to 100 WTG</th><th>Alternative C
(Habitat Alternative)
64–65 WTGs</th><th>Alternative D
(Transit Alternative)
78–93 WTGs</th><th>Alternative E
(Viewshed Alternative)
64–81 WTGs</th><th>Alternative F
(Higher Capacity Turbine Alternative)
56 WTGs</th></tr>
<tr><td rowspan="2">Noise</td><td rowspan="2">Multiple offshore wind project construction periods are anticipated between 2022 and 2027. Construction noise sources will include, most notably, pile driving as well as geological and geophysical surveys, offshore and onshore construction, and aircraft and vessel traffic. These would create noise and may temporarily impact some bird species by displacing them and changing their behavior. Vessel and aircraft noise could also disturb some individual diving birds, but they would acclimate to the noise or move away, potentially resulting in temporary displacement. Collectively, these noise sources would be temporary and localized, resulting in a minor adverse impact to these birds.</td><td>Offshore: Negligible to minor adverse impacts to birds would occur from construction noise related to pile driving as well as geological and geophysical surveys and aircraft and vessel traffic. These activities could flush birds in the path of vessels, causing temporary displacement from the area.
Impacts to birds from operational noise and decommissioning of the offshore facilities would be similar to offshore construction impacts and result in negligible adverse impacts.
Pile driving and other construction noise and activity associated with the Proposed Action could add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in negligible to minor adverse cumulative impacts to birds.</td><td colspan="4">Offshore: Alternatives C through F would slightly decrease noise associated with pile driving for WTGs and other construction-related noise as compared to the Proposed Action, which are short-term negligible to minor adverse impacts.
No measurable change from Proposed Action O&M impacts is anticipated because operational noise sources and levels would be the same: long-term negligible adverse impacts.
Pile driving and other construction noise and activity associated with Alternatives C through F could add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. Potential impacts could be greater if avoidance and displacement of birds occur during seasonal migration periods. However, Alternatives C through F’s contribution would be limited in duration, negligible, and cease when construction ends. No individual fitness (i.e., a bird’s ability to survive and reproduce) or population-level effects would be expected. Therefore, these alternatives when combined with past, present, and reasonably foreseeable activities would result in negligible to minor cumulative adverse impacts to birds.</td></tr>
<tr><td>Onshore: Noise from traffic associated with construction and vegetation removal within the landfall work area and other onshore facilities could affect shorebirds, some seabirds, and land birds that use the terrestrial habitats in the immediate vicinity of construction activities through displacement or avoidance behavior of individuals and/or disruptions in communication, mating, and hunting. The impacts associated with construction would be similar to existing sources of noise and traffic in the local area and therefore are considered a temporary negligible adverse impact.
Temporary noise and construction-related traffic may occasionally be generated due to nonroutine maintenance. Infrequent vehicle usage within the OnSS and ICF may create temporary noise-related disturbance to birds adjacent to the OnSS. However, such disturbance would be short term, and normal avian activity would likely resume after the traffic ceases. BOEM expects these adverse impacts to be negligible.
In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be localized and temporary due to the likely limited extent and duration of noise and would result in negligible adverse cumulative impacts to birds.</td><td colspan="4">Onshore: Alternatives C through F would not alter impacts to onshore activities; therefore, impacts would be the same as those described for the Proposed Action: temporary negligible adverse.</td></tr>
</table>

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Presence of structures	Onshore land development or port expansion activities could result in limited loss of nesting and/or foraging habitat for some bird species. The presence of offshore structures can lead to impacts, both beneficial and adverse, on birds through fish aggregation and the associated increase in foraging opportunities as well as entanglement and gear loss/damage, migration disturbances, and WTG strikes and displacement. These impacts may arise from buoys, met towers, foundations, scour/cable protections, and transmission cable infrastructure. Therefore, these impacts would be **minor** adverse.	**Offshore**: The various types of impacts on birds that could result from the presence of structures during construction include fish aggregation and an associated increase in foraging opportunities as well as entanglement and fishing gear loss/damage, migration disturbances, and displacement. These impacts would be temporary, and BOEM expects them to be **negligible** adverse. **Negligible** to **minor** temporary adverse impacts from bird collisions with visible structures could occur during construction, depending on the species and number of individuals involved. The presence and operation of the offshore facilities may result in displacement of waterbirds, waterfowl, seabirds, and phalaropes that use the area for foraging, resting, or nighttime roosting. Long-term adverse impacts would be **negligible** to **minor**, depending on whether birds are at high risk for displacement or are able to access preferred habitat, and these impacts may change over time if birds become habituated to the presence of the WTGs and OSSs. Impacts to birds from decommissioning of the RWF and offshore RWEC would be similar to those described for the construction phase. The Project is not expected to affect special-status species populations. Cumulative impacts on birds from the presence of structures associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be long term **minor** adverse and long term **minor** beneficial.	**Offshore**: Alternatives C through F would reduce the number of WTGs, potentially resulting in a reduced amount of offshore construction equipment and vessels required. However, because bird exposure to vessels and installation infrastructure would be temporally limited to the construction period, the behavioral vulnerability to collision with construction equipment under Alternatives C through F is expected to be the same as described for the Proposed Action, which are **negligible** to **minor** temporary adverse impacts. During operations, Alternatives C through F would reduce the number of WTGs, potentially allowing for improved maneuverability for birds through the Lease Area and negligibly decreasing the risk of injury or mortality from collision with WTGs as compared to the Proposed Action, and impacts are expected to be long term **negligible** to **minor** adverse. Alternatives C through F would add 56 to 93 additional WTGs and up to two OSSs compared to the No Action Alternative. The total cumulative foundations on the Atlantic OCS would be 3,110, and the Project would account for less than 4% of that total number. Adverse impacts to migration patterns or collision risk from these additional turbines would be negligible and persist until decommissioning is complete. Additionally, beneficial impacts to foraging near offshore structures would similarly be negligible and persist for the life of the Project. Therefore, cumulative impacts on birds from the presence of structures associated with these alternatives when combined with past, present, and reasonably foreseeable activities would be long term **minor** adverse and long term **minor** beneficial.			
		Onshore: Impacts from habitat alteration and land disturbance on coastal and terrestrial bird habitats generated from the construction of the onshore facilities would create habitat loss and conversion, affect bird habitat use, and possibly create habitat degradation. During the breeding season, clearing of trees or vegetation could result in destruction of nests, adversely impacting some individuals. However, lasting impacts to local breeding populations are not anticipated. Collisions between birds and vehicles or construction equipment have some limited potential to cause injury and mortality. Therefore, impacts to birds from construction of onshore facilities would be short term **negligible** to **minor** adverse. The OnSS and ICF would be visible structures that would result in permanent bird habitat conversion and loss. The OnSS access road and fenced-in property would become nonhabitat and result in habitat fragmentation. The conversion of forested cover type outside the OnSS and ICF fences would alter the structural diversity within a forested area by adding more edge habitat. Considering the adjacent landscape consists primarily of residential and commercial developments with some undisturbed areas of ruderal forested swamp, the adverse impacts to birds from the OnSS and the ICF on forested habitat fragmentation would be long term **negligible** to **minor**. The potential for avian mortality or injury due to the low risk of collision with the OnSS and related structures would be a long-term	**Onshore**: Alternatives C through F would not alter impacts to onshore activities; therefore, impacts would be the same as those described for the Proposed Action: temporary to long-term **negligible** to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
		minor adverse impact. The potential for avian avoidance behavior related to habitat conversion and loss from the OnSS would also be a long-term **minor** adverse impact. Adverse impacts to birds from habitat fragmentation related to a visible change in the landscape during decommissioning would be **negligible** because local populations would have adapted to the landscape changes. The presence of these structures when considered in the context of ongoing and planned actions within the GAA would be a very minor risk of mortality or injury to birds due to collision, and generally, the changes to the habitat conditions would result in avoidance behavior and may influence bird habitat selection. Therefore, BOEM anticipates long-term **negligible** to **minor** adverse cumulative impacts to birds.				

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3.7.2.2 Alternative B: Impacts of the Proposed Action Alternative on Birds

3.7.2.2.1 Construction and Installation

Offshore Activities and Facilities

Accidental releases and discharges: Some potential for mortality, decreased fitness, and health effects exists due to the accidental release of fuel, hazmat, and trash and debris from vessels associated with construction and installation of the Proposed Action. Vessels associated with the Proposed Action may generate operational waste, including bilge and ballast water, sanitary and domestic wastes, and trash and debris. All vessels associated with the Proposed Action would comply with USCG requirements and BSEE regulations for the prevention and control of oil and fuel spills. Potential adverse impacts to birds from contaminant discharges or releases or from improper disposal of trash or debris during construction would be avoided or minimized with adherence to federal, state, and local regulations regarding disposal of solid and liquid wastes, resulting in short-term **negligible** to **minor** adverse impacts. Accidental spills or releases of oils or other hazardous materials offshore would be managed through the OSRP (see COP Appendix D). Additionally, training and awareness of BMPs proposed for waste management and mitigation of marine debris would be required of Project personnel, reducing the likelihood of occurrence to a very low risk. These accidental releases, if any, would occur infrequently at discrete locations and vary widely in space and time; for this reason, BOEM expects localized and temporary **negligible** adverse impacts on birds.

Anchoring and new cable emplacement/maintenance: Construction of the WTG foundations and the installation of the submarine cables could result in short-term habitat disturbance for foraging birds. Seafloor disturbed by cable installation and dredging prior to cable installation would result in turbidity effects that could reduce marine bird foraging success or have temporary and localized impacts on marine bird prey species. These impacts would be temporary, lasting up to 12 hours, and localized to the emplacement corridor. Vessel anchoring during construction would also result in increased turbidity. Individual birds would successfully forage in nearby areas not affected by increased turbidity/sedimentation during anchoring and cable emplacement, and only nonmeasurable **negligible** adverse impacts, if any, on individuals or populations would be expected given the localized and temporary nature of construction activities.

Climate change: Construction of the offshore facilities would result in a small temporary increase in GHG emissions within the GAA during the construction phase. However, these emissions could be reduced by staggering construction time frames and implementing applicant-proposed EPMs (see Table G-1 in Appendix G). As a result, adverse impacts to birds from construction of the Proposed Action associated with climate change would be short term **negligible** adverse.

Light: Lighting used during construction would be limited to the minimum required for safety during construction activities to minimize potential impacts. Therefore, adverse impacts to birds from lighting during construction would be localized and temporary **negligible** to **minor** adverse.

Noise: **Negligible** to **minor** adverse impacts to birds would occur from construction noise related to pile driving as well as geological and geophysical surveys and aircraft and vessel traffic. These activities could flush birds in the path of vessels, causing temporary displacement from the area. However, these impacts would be temporary and similar to baseline conditions as vessel traffic already occurs, resulting in similar temporary displacement of birds in the GAA (Stantec 2018). These impacts could be greater if avoidance and displacement of birds occur during seasonal migration periods.

Presence of structures: The various types of impacts on birds that could result from the presence of structures during construction include fish aggregation and an associated increase in foraging opportunities as well as entanglement and fishing gear loss/damage, migration disturbances, and displacement. These impacts would be temporary, and BOEM expects them to be **negligible** adverse. **Negligible** to **minor** temporary adverse impacts from bird collisions with visible structures could occur during construction, depending on the species and number of individuals involved.

Onshore Activities and Facilities

Accidental releases and discharges: Onshore, construction and HDD activities could result in the accidental releases of fuel, fluids, or hazmat; sediment; and/or trash and debris. These releases, if any, would occur infrequently at discrete locations and vary widely in space and time. Revolution Wind would prepare a construction SPCC plan in accordance with applicable requirements and would outline spill prevention training, plans, and steps to take to contain and clean up spills that could occur. Based on the low risk of spills due to implementation of safe handling, storage, and cleanup procedures, impacts from accidental spills and trash would represent a localized and temporary **negligible** adverse impact to birds.

Climate change: Onshore impacts to birds associated with climate change from construction of the Proposed Action would be similar to those discussed above for offshore facilities and activities: short term **negligible** adverse.

Light: Most of the onshore construction would occur during the daylight hours, although some overnight lighting may occasionally be necessary during construction of the onshore facilities. However, this is not expected to have a measurable effect on bird behavior, therefore BOEM anticipates temporary **negligible** adverse impacts to birds.

New cable emplacement/maintenance: Land disturbance and habitat alteration resulting from construction within the landfall work area may result in the direct injury or mortality of bird species. Mobile individuals would be able to temporarily vacate an area of disturbance and therefore would be less susceptible to mortality or injury compared to less mobile (pre-volant) individuals. Mitigations like observing time-of-year restrictions on vegetation removal would avoid the breeding season of birds, thus reducing the likelihood of injury and/or mortality from construction activities. Therefore, the impacts (e.g., injury and/or mortality) resulting from land disturbance and habitat alteration would be temporary **negligible** adverse. Further, HDD would be employed to make the connection between the onshore transmission cable and the landfall work area, which would limit or completely avoid impacts to the human-made shoreline and the ruderal grassland/shrubland because the onshore transmission cable would be installed under these resources. Because construction work within the landfall work area would occur largely outside of the breeding period of listed species that might nest in the area, and because use of the shoreline by shorebirds within the landfall work area has not been documented (vhb 2021), onshore impacts for listed species from land disturbance would be **negligible** adverse. A detailed impacts analysis to federally listed birds from construction activities is in the USFWS BA (BOEM 2022).

The temporary onshore construction work area for HDD operations would likely be situated within a previously developed area (e.g., an existing parking lot) and would not impact the human-made shoreline and/or the ruderal grassland/shrubland. Because the landfall work area is limited to anthropogenically made or disturbed features of the human-made shoreline and the ruderal grassland/shrubland, the potential for land disturbance and habitat alteration to significantly affect birds is **negligible** adverse. Additional land disturbance and habitat alteration would result from the installation of the onshore transmission cable from the transition joint bays to the OnSS. The onshore transmission cable installation would result in temporary ground disturbance. Most of the temporary ground disturbance would occur in previously disturbed areas along paved roads or parking lots and would not result in impacts to bird habitat.

Onshore transmission cable installation would also result in temporary ground disturbance. Most of the temporary ground disturbance would occur in previously disturbed areas along paved roads or parking lots and would not result in impacts to bird habitat.

<u>Noise:</u> Noise from traffic associated with construction and vegetation removal within the landfall work area and other onshore facilities could affect shorebirds, some seabirds, and land birds that use the terrestrial habitats in the immediate vicinity of construction activities through displacement or avoidance behavior of individuals and/or disruptions in communication, mating, and hunting. Displacement and avoidance behavior are expected to only occur during construction, which would occur primarily in already developed areas where birds are habituated to these types of activities. The impacts associated with construction would be similar to existing sources of noise and traffic in the local area and therefore are considered a temporary **negligible** adverse impact.

<u>Presence of structures:</u> Impacts from habitat alteration and land disturbance on coastal and terrestrial bird habitats generated from the construction of the onshore facilities would create habitat loss and conversion, affect bird habitat use, and possibly create habitat degradation. The OnSS and ICF parcels include ruderal forested swamp, shrub marsh, ruderal mixed oak/white pine forest, ruderal pitch pine barren, and a landfill. Vegetation clearing and ongoing vegetation management would convert some of these cover types to permanently developed land or shrubland within the areas that would undergo vegetation maintenance. This habitat conversion may be detrimental to species reliant on forest habitat but beneficial to other species that are more suited to the newly converted habitat (e.g., passerines adapted to grassland and shrubland). The OnSS would result in a permanent loss of 3.8 acres of mixed oak/white pine forest and 0.6 acre of ruderal pitch pine barren. However, the portion of forested habitat removal would be small relative to the available forested habitat in the surrounding area. During the breeding season, clearing of trees or vegetation could result in destruction of nests, adversely impacting some individuals. However, lasting impacts to local breeding populations are not anticipated. Tree and shrub removal work would occur before May 1 and after August 15, as feasible (see COP Table ES-1), to avoid the potential disturbance of birds during the breeding season. If tree and shrub removal cannot be avoided during this season, Revolution Wind would coordinate with the appropriate agencies to determine the appropriate course of action. Visible structures (i.e., construction equipment) would be present during construction of the onshore facilities. Collisions between birds and vehicles or construction equipment have some limited potential to cause injury and mortality. However, these impacts, if any, would be temporary **negligible** adverse, as most individuals would avoid noisy construction areas (Bayne et al. 2008; Goodwin and Shriver 2010; McLaughlin and Kunc 2013). Therefore, impacts to birds from construction of onshore facilities would be short term **negligible** to **minor** adverse.

3.7.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Accidental releases and discharges: Impacts to birds from this IPF during operation and decommissioning of the offshore facilities are expected would be similar to offshore construction impacts and result in short-term **negligible** to **minor** adverse impacts with compliance with the USCG requirements and BSEE regulations for the prevention and control of oil and fuel spills and adherence to federal, state, and local regulations regarding disposal of solid and liquid wastes.

Anchoring and new cable emplacement/maintenance: Other than temporary increases in turbidity from seafloor disturbance due to occasional vessel anchoring, no impacts to bird species are anticipated during the O&M phase for the offshore RWF or RWEC. Impacts from decommissioning would be similar to construction impacts unless the RWEC is abandoned in place: **negligible** adverse.

Climate change: The expected impacts on climate change from operation of the offshore facilities alone would not result in a measurable increase in the adverse impacts to birds beyond those described under the No Action Alternative. In addition, operation of the Proposed Action could also contribute to a long-term net decrease in GHG emissions and may beneficially contribute to a broader combination of actions to reduce future impacts to birds from climate change over the long term due to reduced reliance on fossil fuel–generated energy sources, but this change would likely not be measurable. Therefore, BOEM expects the impacts from the Proposed Action on climate change would be long term **negligible**.

Light: Under the Proposed Action, up to 100 WTGs and up to two OSSs would be lit with USCG navigational and FAA hazard lighting. These lights have some potential to attract birds and result in increased collision risk (Hüppop et al. 2006). However, the mandatory use of red flashing aviation obstruction lights and the avoidance of any steady-burning aviation obstruction lights are expected to minimize bird attraction and therefore collision risk (Kerlinger et al. 2010; Orr et al. 2016). For this reason, BOEM expects adverse impacts, if any, to be long term **negligible** adverse from offshore lighting.

Noise: Impacts to birds from operational noise and decommissioning of the offshore facilities would be similar to offshore construction impacts and result in **negligible** adverse impacts.

Presence of structures: Within the Atlantic Flyway along the North American Atlantic coast, much of the bird activity is concentrated along the coastline (Watts 2010). Waterbirds use a corridor between the coast and several kilometers out onto the Atlantic OCS, whereas land birds tend to use a wider corridor extending from the coastline to tens of kilometers inland (Watts 2010). However, operation of the Proposed Action would result in impacts on some individuals of offshore bird species and possibly some individuals of coastal and inland bird species during spring and fall migration. These impacts could arise through direct mortality from collisions with WTGs and/or through behavioral avoidance and habitat loss (Drewitt and Langston 2006; Fox et al. 2006; Goodale and Millman 2016). To reduce the collision risk with WTGs, Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with a spacing of approximately 1.15 miles (1 nm) × 1.15 miles (1 nm) that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This wide spacing of WTGs is expected to allow birds to avoid individual WTGs and minimize risk of potential collision (see COP Table ES-1).

In COP Appendix AA (bri 2021), vulnerability was assessed to determine how sensitive a bird population is to mortality or habitat loss related to the presence of a wind farm and in terms of collision vulnerability and displacement vulnerability. Factors considered in vulnerability assessments include vital rates, existing population trends, relative abundance, nocturnal flight activity, diurnal flight activity, avoidance, proportion of time within the RSZ, maneuverability in flight, percentage of time flying, and habitat flexibility. Avian flight heights were important in the assessment of behavioral vulnerability. Flight heights used in the assessment were gathered from OSAMP boat-based surveys (local) and datasets in the Northwest Atlantic Seabird Catalog (regional). Final exposure and vulnerability assessments for each taxonomic group and species are provided in Sections 3.4 through 3.10 of COP Appendix AA (bri 2021) and in Table 3-38 of COP Appendix AA (bri 2021).

The presence and operation of the offshore facilities may result in displacement of waterbirds, waterfowl, seabirds, and phalaropes that use the area for foraging, resting, or nighttime roosting. Some species can be displaced several kilometers outside the Lease Area (Welcker and Nehls 2016). Generally, the relative abundance of bird species that are most sensitive to displacement is low within the offshore portion of the Project during all seasons (bri 2021). These long-term adverse impacts would be **negligible** to **minor**, depending on whether birds are at high risk for displacement or are able to access preferred habitat, and these impacts may change over time if birds become habituated to the presence of the WTGs and OSSs. Impacts to birds from decommissioning of the RWF and offshore RWEC would be similar to those described for the construction phase.

The Lease Area is generally beyond the range of most breeding terrestrial or coastal bird species. Coastal birds that may forage in the Lease Area occasionally, visit the area sporadically, or pass through on their spring and/or fall migrations include shorebirds (e.g., sandpipers, plovers), waterbirds (e.g., cormorants, grebes), waterfowl (e.g., scoters, mergansers), wading birds (e.g., herons, egrets), raptors (e.g., falcons, eagles), and songbirds (e.g., warblers, sparrows). Overall, with the exception of migratory falcons and songbirds, coastal birds are considered to have minimal exposure to the Lease Area. Falcons, primarily peregrine falcons, may be exposed to the Lease Area. Some migratory songbirds, particularly the blackpoll warbler, may also be exposed to the Lease Area during fall migration, but population-level impacts are unlikely because exposure of the population to the Lease Area is expected to be minimal to low and limited to migration. Of the marine birds, loons, sea ducks, gulls, terns, and auks received up to a medium overall exposure assessment. Loons, sea ducks, gannets, and auks are documented to avoid wind farms, but displacement from the Lease Area is unlikely to affect populations because there is likely available foraging habitat outside the Lease Area (bri 2021).

Special-status bird species were also assessed, including golden eagle, bald eagle, red knot, piping plover, and roseate tern. The Project is not expected to affect special-status species populations. Golden and bald eagle exposure to the Lease Area is considered minimal because these species are rarely detected in the offshore environment. Red knots and piping plovers have the potential to be exposed only during migration, and vulnerability to collision is considered low because shorebirds fly substantially above the RSZ during migrations. Although tracked roseate terns were estimated to have passed through the northern portion of the Lease Area (bri 2021), individual impacts are unlikely because the birds were not detected in the Lease Area during surveys, and they would be primarily flying below the RSZ. A detailed analysis of the impacts from O&M and decommissioning of the offshore facilities on federally listed birds can be found in the BA (BOEM 2022).

Onshore Activities and Facilities

Accidental releases and discharges: The OnSS would require various oils, fuels, and lubricants to support its operation. As described above in Section 3.7.2.2.1, accidental discharges, releases, and disposal could indirectly cause bird habitat degradation; however, risks would be avoided through spill prevention and control measures and associated BMPs. Therefore, potential adverse impacts associated with discharges and releases are considered short term and localized **negligible** adverse.

Climate change: No measurable climate change impacts to birds from O&M of the onshore facilities are expected. Climate change impacts from decommissioning would be similar to those described for construction. Therefore, the adverse impacts from this IPF are expected to be long term **negligible** adverse.

Light: During the O&M of the OnSS and ICF, yard lighting would be used for assessment of equipment. In general, operational lighting would be limited to the minimum necessary to ensure safety and compliance with applicable regulations (see COP Table ES-1). Most decommissioning activities would occur during the day, and overnight lighting would only be necessary if there is work in progress on-site or lights are left on for safety and security purposes. Therefore, the adverse impacts resulting from this IPF would be long term **negligible**.

New cable emplacement/maintenance: Operation of the onshore transmission cable would pose no risk to birds because it would be buried. Land disturbance in the form of vegetation management would occur on a periodic basis to maintain vegetation at shrub height within the perimeters of the onshore facilities. Hazard tree removal would be performed on a cyclical basis to inspect and remove trees that may fail that are outside the edge of the maintained ROW. Land disturbance as it relates to vegetation clearing may result in the direct injury or mortality of birds. However, mortality and injury impacts would be mitigated by observing time-of-year restrictions on vegetation removal that would avoid the breeding season of bird species. Therefore, the adverse impacts resulting from this IPF would be **negligible**. Impacts from land disturbance during decommissioning would be similar to those described in Section 3.7.2.2.1, though the impacts would likely be less because new vegetation clearing, and grading would not be necessary.

Noise: According to the vhb (2021) onshore acoustic assessment, during O&M, the proposed OnSS and ICF would introduce new sources of sound, which is modeled to be 45.5 dBA (Leq) or less when measured at the nearest anthropogenic sensitive receptors and falls within the ambient sound range measured at baseline conditions. Temporary noise and construction-related traffic may occasionally be generated due to nonroutine maintenance. Pickup trucks or other automobiles would be used to make routine visits to the OnSS and ICF during O&M. Occasional maintenance and operational emergency visits may necessitate bucket trucks, cranes, and similar vehicles to facilitate these activities. Infrequent vehicle usage within the OnSS and ICF may create temporary noise-related disturbance to birds adjacent to the OnSS. However, such disturbance would be short term, and normal avian activity would likely resume after the traffic ceases. BOEM expects these adverse impacts to be **negligible**.

Presence of structures: The OnSS and ICF would be visible structures that would result in permanent bird habitat conversion and loss. The OnSS access road and fenced-in property would become nonhabitat and result in habitat fragmentation. The conversion of forested cover type outside the OnSS and ICF fences would alter the structural diversity within a forested area by adding more edge habitat. Considering the adjacent landscape consists primarily of residential and commercial developments with some undisturbed areas of ruderal forested swamp, the adverse impacts to birds from the OnSS and the ICF on forested habitat fragmentation would be long term **negligible** to **minor**.

This change in the visible landscape would present a very minor risk of mortality or injury to birds due to collision with the OnSS or ICF, and, generally, the changes to the habitat conditions would result in avoidance behavior and may influence bird habitat selection near these structures (e.g., breeding habitat for some forest-dependent species may be less suitable). These impact risks would exist throughout the O&M phase of the Project. The potential for avian mortality or injury due to the low risk of collision with the OnSS and related structures would be a long-term **minor** adverse impact. The potential for avian avoidance behavior related to habitat conversion and loss from the OnSS would also be a long-term **minor** adverse impact. If the footprint of the OnSS and ICF yards are left in place after they have been decommissioned and equipment has been removed, the remaining development would still be considered a visible structure because it would remain a hard structure within a forested area. Adverse impacts to birds from habitat fragmentation related to a visible change in the landscape during decommissioning would be **negligible** because local populations would have adapted to the landscape changes.

3.7.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

<u>Accidental releases and discharges:</u> Future offshore wind activities would contribute to an increased risk of spills and associated impacts due to fuel, fluid, or hazmat exposure. The contribution from future offshore wind and the Proposed Action would be a low and non-measurable percentage of the overall spill risk from all ongoing offshore activities. In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be likely limited in extent and duration and would result in localized and temporary **negligible** adverse cumulative impacts on birds.

<u>Anchoring and new cable emplacement/maintenance</u>: The Proposed Action would add 7,258 acres of seafloor disturbance from the operation of WTG foundations and scour protection, RWEC and IAC installation, and anchoring to the No Action Alternative, which equates to 31% of the total seafloor disturbance estimated under the No Action Alternative. This would result in localized turbidity effects that could reduce marine bird foraging success or impact marine bird prey species. However, individual birds would be expected to successfully forage in nearby areas not affected by increased turbidity, and only non-measurable **negligible** adverse impacts, if any, on individuals or populations would be expected given the localized and temporary nature of the potential impacts. In the context of reasonably foreseeable environmental trends, the combined cable emplacement impacts from ongoing and planned actions, including the Proposed Action, could occur if impacts are in close temporal and spatial proximity. However, these adverse impacts from anchoring and cable emplacement would be **negligible** and would not be biologically significant. For these reasons, the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term **negligible** to **minor** cumulative adverse impacts to birds.

<u>Climate change:</u> The types of impacts from global climate change described for the No Action Alternative would occur under the Proposed Action. However, the Proposed Action could also contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce

climate change impacts. Therefore, long-term **minor** adverse and long-term **negligible** beneficial cumulative impacts to birds are expected.

Light: The Proposed Action would add up to 100 new WTGs with red flashing aviation hazard lighting to the No Action Alternative; these lights could attract birds and result in increased collision risk (Hüppop et al. 2006). Additionally, marine navigation lighting would include one or more flashing white lights on each WTG and the OSSs and would be directed out and down to the water surface. Vessel lights during construction and installation, O&M, and decommissioning would be minimal and limited to vessels transiting to and from wind farm areas. Ongoing and future non–offshore wind activities are expected to cause short-term impacts, primarily from vessel lights. For these reasons, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in long-term **negligible** to **minor** adverse cumulative impacts to birds, and no individual or population-level impacts would be expected.

Noise: Pile driving and other construction noise and activity associated with the Proposed Action could add to baseline noise and activity associated with other offshore wind projects with overlapping construction periods. Potential impacts could be greater if avoidance and displacement of birds occur during seasonal migration periods. However, the Proposed Action's contribution to adverse noise impacts would be limited in duration, negligible, and cease when construction ends. No individual fitness (i.e., a bird's ability to survive and reproduce) or population-level effects would be expected. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in **negligible** to **minor** adverse cumulative impacts to birds.

Presence of structures: The Proposed Action would add up to 100 additional WTGs and up to two OSSs compared to the No Action Alternative. The total cumulative foundations on the Atlantic OCS would be 3,110, and the Project would account for less than 4% of that total number. Adverse impacts to migration patterns or collision risk from these additional turbines would be negligible and would persist until decommissioning is complete. Additionally, beneficial impacts to foraging near offshore structures would similarly be negligible and persist for the life of the Project. Therefore, cumulative impacts on birds from the presence of structures associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be long term **minor** adverse and long term **minor** beneficial.

Onshore Activities and Facilities

Accidental releases and discharges: Onshore construction activities and operation of the OnSS under the Proposed Action could result in the accidental releases of fuel, fluids, or hazmat; sediment; and/or trash and debris. These releases, if any, would occur infrequently at discrete locations and vary widely in space and time. Ongoing and future onshore activities could contribute to impacts to birds from accidental releases if they occur at the same time within the GAA. However, incidences such as these would be mitigated by implementation of project-specific SPCC plans. In the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be localized and temporary due to the likely limited extent and duration of a release and result in **negligible** adverse cumulative impacts to birds.

Climate change: The types of impacts from global climate change described for the No Action Alternative would occur under the Proposed Action, but no measurable change from the operational impacts of onshore activities and facilities to birds under the No Action Alternative is anticipated. Therefore, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action and cumulative impacts, are expected to be long term **minor** adverse.

Light: Lighting used during construction of the Proposed Action would be limited to the minimum required for safety. Operational lighting would be limited to the minimum necessary to ensure safety and compliance with applicable regulations (see COP Table ES-1). Decommissioning activities would primarily occur during the day, and overnight lighting is not expected. Therefore, impacts to birds from the Proposed Action would be localized and temporary **negligible** to **minor** adverse. Ongoing and future onshore activities could contribute to impacts to birds from light if they occur at the same time within the GAA. However, these effects are also expected to be localized and temporary and would not contribute to adverse cumulative impacts to birds in the GAA.

New cable emplacement/maintenance: The Proposed Action would result in temporary ground disturbance from installation of the onshore transmission cable and construction at the landfall work area. Most of this temporary ground disturbance would occur in previously disturbed areas along paved roads or parking lots and would not result in impacts to bird habitat. Operation of the onshore transmission cable would pose no risk to birds because it would be buried, and no other impacts to bird species are anticipated during routine onshore operations. Therefore, the contribution of the Proposed Action on adverse cumulative impacts to birds from new cable emplacement or maintenance in the context of reasonably foreseeable onshore environmental trends within the GAA is expected to be **negligible** adverse.

Noise: Onshore construction activities would add to onshore noise, resulting in localized and temporary impacts to birds (i.e., avoidance and displacement), particularly if ongoing and planned onshore activities overlap with the Proposed Action in space and time. Normal operation of the OnSS would generate continuous noise. However, BOEM expects long-term **negligible** adverse impacts when considered in the context of the other commercial and industrial noises nearby. Therefore, in the context of reasonably foreseeable environmental trends, the combined impacts from this IPF from ongoing and planned actions, including the Proposed Action, would be localized and temporary due to the likely limited extent and duration of noise and would result in **negligible** adverse cumulative impacts to birds.

Presence of structures: The Proposed Action would result in the permanent conversion, loss, and fragmentation of onshore bird habitat through the removal of forested cover types for construction of the OnSS and the ICF. These actions could result in localized and temporary impacts to birds, including avoidance and displacement, although no individual fitness or population-level effects would be expected. These changes would have a **negligible** adverse effect on birds because forested habitat is common within the surrounding area. In addition, the permanent onshore facilities (ICF and OnSS) would be located on the edge of previously developed areas. The presence of these structures when considered in the context of ongoing and planned actions within the GAA would be a very minor risk of mortality or injury to birds due to collision, and generally, the changes to the habitat conditions would result in avoidance behavior and may influence bird habitat selection. Therefore, BOEM anticipates long-term **negligible** to **minor** adverse cumulative impacts to birds.

3.7.2.2.4 Conclusions

Project construction and installation and decommissioning would introduce noise, lighting, human activity, debris and contaminants, and new structures and vessels (increasing potential collision risk) to the GAA as well as alter existing bird habitat. Noise, lighting, and human activity impacts from Project

O&M would occur, although at lower levels than those produced during construction and decommissioning. Offshore structures would also represent a long-term collision risk. BOEM anticipates the impacts resulting from the Proposed Action alone would range from **negligible** to **minor** adverse for the duration of the Project. 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 with other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from temporary to long term **negligible** to **minor** adverse as well as long term **negligible** 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** cumulative adverse impacts to birds. This determination is because the impacts would not be expected to result in noticeable change to the condition of birds in the GAA, and the populations would recover completely without remedial or mitigating action.

3.7.2.3 Alternatives C, D, E, and F

Table 3.7-2 provides an analysis of all evaluated IPFs for birds across these alternatives.

3.7.2.3.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated IACs, which would have an associated reduction in potential collision risk, BOEM expects that the impacts to birds resulting from the alternative alone would be similar to the Proposed Action and range from **negligible** to **minor** adverse.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternatives C through F's 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 Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same level as under the Proposed Action: **minor** adverse.

3.7.2.4 Mitigation

Use of bird-deterrent devices and conducting marine construction activities during approved in-water work windows, which would be developed in consultation with NMFS and USFWS, would further reduce the expected negligible to minor long-term impacts on birds by minimizing bird attraction to operating WTGs and OSSs (see Table F-2 in Appendix F for details). Implementation of Revolution Wind's *Avian and Bat Post- Construction Monitoring Framework* (see Appendix G and COP Appendix AA) would not reduce impacts; however, the data gathered from the monitoring would be used to evaluate impacts and potentially lead to additional mitigation measures, if required (30 CFR 585.633(b)). If the reported postconstruction bird and bat monitoring results indicate bird and bat impacts deviate substantially from the impact analysis included in this EIS, then Revolution Wind would be required to recommend new mitigation measures or monitoring methods.

3.8 Coastal Habitats and Fauna

3.8.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Coastal Habitats and Fauna

Geographic analysis area: The GAA for coastal habitats and fauna (see Figure 3.8-1) comprises the construction footprints for the following onshore project components: the onshore transmission cable, landfall work area, OnSS, and ICF. The coastal habitats within the GAA include the area from state waters inland to the mainland, including the foreshore, backshore, dunes, and interdunal areas. Aquatic habitats are discussed in Section 3.21 and Section 3.6. Offshore components of the proposed Project would not impact coastal habitat and fauna other than certain avian and bat species, which are discussed in Section 3.7 and Section 3.5, respectively.

Affected environment: Appendix K of the COP includes the results of field investigations conducted for the Project's onshore facilities as well as descriptions of habitats, delineations of freshwater and coastal wetlands, identification of plant and wildlife species, records of rare species observations, and observations of invasive species (vhb 2021). Plant communities were documented by vhb and compared to the key habitat profiles provided in the RIWAP (Rhode Island DEM et al. 2015) to assign the appropriate plant communities within the analysis area. These plant communities are provided in Table 3.8-1 and described below. "Native coastal fauna" is defined herein as terrestrial mammals, reptiles, amphibians, and terrestrial and intertidal invertebrates. Most of the GAA for coastal habitats and fauna is disturbed from previous anthropogenic uses. Therefore, habitat quality and the potential suitability for use by fauna have been degraded. However, several key habitats, as identified in the RIWAP (Rhode Island DEM et al. 2015), suitable to a range of wildlife and plant species are present in the GAA. Invasive plant species are prevalent throughout the GAA because of prior anthropogenic disturbance (vhb 2021). vhb identified habitat for a variety of terrestrial mammals, reptiles, and amphibians during habitat assessment surveys conducted July 30, August 14, September 3, and December 10, 2019, and March 27 and July 13, 2020.

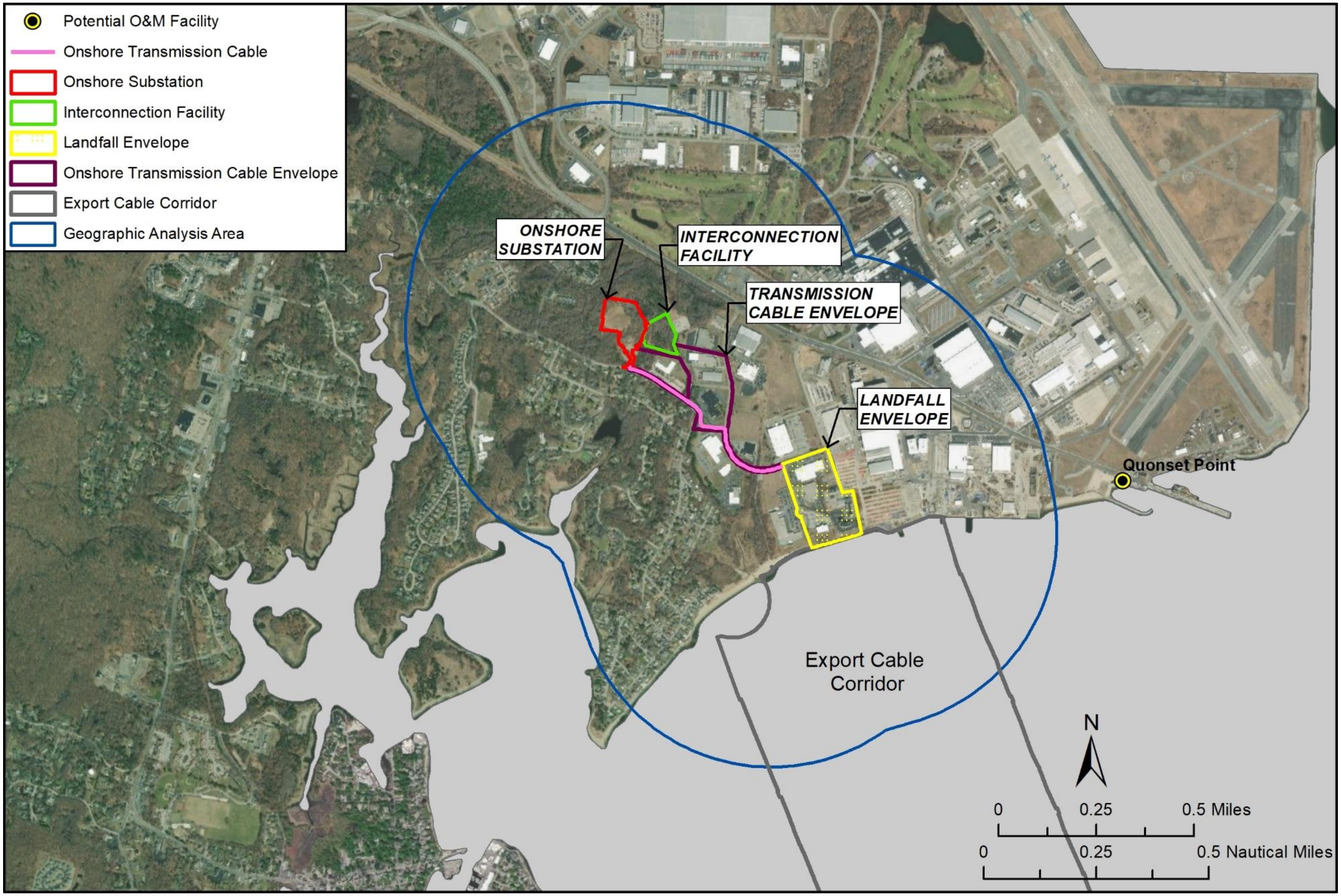

Figure 3.8-1. Geographic analysis area for coastal habitats and fauna.

Table 3.8-1. Plant Communities in the Geographic Analysis Area for Coastal Habitats and Fauna

Plant Community	Area in the Geographic Analysis Area (acres)
Landfall Work Area	
Modified coastal beach	0.330
Ruderal grassland/shrubland	1.300
OnSS	
Mixed oak/white pine forest	3.800
Capped landfill	2.600
Pitch pine barren	0.600
Ruderal shrub marsh	0.001
ICF	
Mixed oak/white pine forest	3.500
Ruderal forested swamp	0.100
Ruderal grassland/shrubland	0.050
Ruderal shrub marsh	0.010
Transmission Cable Envelope	
Mixed oak/white pine forest	0.560
Softwood forest	0.320
Mowed lawn	0.020
Ruderal grassland/shrubland	0.020
Oak forest	0.008
Pitch pine barren	0.006

Source: vhb (2021); Rhode Island DEM et al. (2015)

Landfall Work Area

The modified coastal beach plant community comprises areas within the landfall work area that have been altered by placement of seawalls and riprap revetments, which expose the sandy beach during low tides. Vegetation at the base of the seawall and along the top of the seawall includes spotted knapweed (*Centaurea maculosa*), an invasive species; common milkweed (*Asclepias syriaca*); prickly lettuce (*Lactuca serriola*); and American pokeweed (*Phytolacca americana*). Adjacent to areas of modified coastal beach, the landfall work area contains ruderal grassland/shrubland. Ruderal grasslands/shrublands constitute early successional habitats defined by Anderson et al. (1976) as uplands where the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs. Such habitats are typically anthropogenically created or maintained due to management strategies. The vegetation within ruderal grassland/shrubland areas is similar to the species composition along the seawall described above and also includes northern bayberry (*Myrica pensylvanica*) and eastern red cedar (*Juniperus virginiana*) (vhb 2021).

Transmission Cable Envelope

The transmission cable envelope is comprised primarily of industrial and residential land uses and consists of lots with managed lawns. Although managed lawn is not considered a key habitat by the RIWAP, it provides limited utility to some species of wildlife (e.g., passerines and rodents) in an otherwise heavily developed industrial and commercial area. It should be noted that some of these lots containing only managed lawn may be designated for future development (vhb 2021). The preferred transmission cable route is an approximate 1 mile (1.6 km) route that would predominantly follow along paved roads or previously disturbed areas such as parking lots.

Some of the alternative routes under consideration within the transmission cable envelope contain segments that would pass through undeveloped, vegetated areas and would be approximately the same length. Alternative transmission cable routes would pass a vacant lot that supports a dry ruderal grassland/shrubland field that gently slopes downward toward an access path. This plant community supports a mix of shrubs and herbaceous forbs and grasses, including eastern red cedar, pitch pine (*Pinus rigida*), *Yucca* sp., Virginia creeper (*Parthenocissus quinquefolia*), and common milkweed. The ruderal grassland/shrubland supports some invasive species, including autumn olive (*Elaeagnus umbellate*), Morrow's honeysuckle (*Lonicera morrowii*), Asiatic bittersweet (*Celastrus orbiculatus*), and mugwort (*Artemisia* sp.). Alternative onshore cable transmission routes would also pass through upland forest and shrubland. Vegetation within this area shows signs of anthropogenic disturbance and is composed of a ruderal mixed oak/white pine forest with a shrubby understory. Dominant vegetation within the canopy layer includes eastern white pine (*Pinus strobus*), red oak (*Quercus rubra*), white oak (*Quercus alba*), and eastern red cedar. Dominant species within the shrub and herb stratum include autumn olive, Morrow's honeysuckle, Asiatic bittersweet, multiflora rose (Rosa multiflora), green briar (*Smilax rotundifolia*), garlic mustard (*Alliaria petiolata*), and poison ivy (*Toxicodendron radicans*) (vhb 2021).

Onshore Substation and Interconnection Facility

The primary plant community within the footprint of both the OnSS and the ICF is mixed oak/white pine forest. Dominant species within the canopy include red oak, black oak (*Quercus velutina*), scarlet oak (*Quercus coccinea*), and eastern white pine, and other canopy species include red maple, black cherry *(Prunus serotina*), and black birch (*Betula lenta*). Understory vegetation includes Morrow's honeysuckle, common greenbrier, Virginia creeper, and spotted wintergreen (*Chimaphila maculata*). As with the adjoining ruderal forested swamp that occurs within the OnSS footprint (described below), the oak and white pine forest shows signs of human disturbance from its previous use as a landfill.

Ruderal forested swamp is also present within the OnSS footprint. The dominant canopy species within the forested swamp is red maple (*Acer rubrum*) with scattered patches of black gum (*Nyssa sylvatica*), swamp white oak (*Quercus bicolor*), red oak, and eastern white pine. The understory contains scattered sapling recruitment from the canopy layer and shrub thickets of sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), and alder (*Alnus* sp.). Poison ivy, green briar, sensitive fern (*Onoclea sensibilis*), and skunk cabbage (*Symplocarpus foetidus*) are common in the herbaceous stratum. A ruderal shrub marsh is present in the northern part of the OnSS footprint. The southern boundary of the marsh is highly altered, with demolition debris stacked along slopes above the marsh. The northern limit of the marsh extends beyond the OnSS footprint based on available topographic mapping and aerial photographs. The ruderal shrub marsh has a forested perimeter, and open water seasonally inundates the shrubland cover type (vhb 2021).

A large area (2.6 acres) within the OnSS footprint is considered capped landfill because of the alterations associated with the former Camp Avenue Dump, which is listed on the Superfund Enterprise Management System database as a State Hazardous Waste Site. From approximately 1949 to 1953, and as late as 1970, the Camp Avenue Dump was used as a general landfill by the U.S. Navy before the Quonset Point Naval Air Station was deactivated in 1974. Previous studies conducted at the dump, as well as field observations during Project surveys, reported wastes such as construction debris, roofing tar, ship parts, and unspecified industrial waste (vhb 2020a). Evidence of the site's past use as a landfill is present throughout with fill artifacts, disturbed topography that indicates previous cutting and filling, and pervasive invasive vegetation that includes glossy buckthorn (Frangula alnus), Asiatic bittersweet, Morrow's honeysuckle, black locust (Robinia pseudoacacia), multiflora rose, privet (Ligustrum sp.), tree of heaven (*Ailanthus altissima*), black swallow-wort (*Cynanchum louiseae*), mugwort, and garlic mustard (vhb 2021).

General wildlife records for the GAA are based on observations made during vhb's field investigations in July, August, September, and December 2019 and March and July 2020; the review of the RIWAP for species tied to specific key habitats within the GAA; and other pertinent literature, including *New England Wildlife: Habitat, Natural History, and Distribution* (DeGraaf and Yamasaki 2001). Appendix C in COP Appendix K (vhb 2021) provides a list of wildlife species observed during field investigations and species with the potential to occur within the GAA based on habitat preferences and habitat availability.

vhb evaluated information from the USFWS IPaC tool and the Rhode Island DEM ERM to assess if any federal or state-listed species; rare, threatened, or endangered species; or species of greatest conservation need were present within the analysis area. During field investigations for the onshore transmission cable, butterfly milkweed (*Asclepias tuberosa*), a Rhode Island state species of concern was recorded. Butterfly milkweed has showy orange flowers in umbels and occurs within disturbed habitats, grassland, meadows, and fields. As with other milkweed species, this plant provides important food sources for the larval form of butterfly species. This includes the monarch butterfly (*Danaus plexippus*), which is a candidate species under the federal ESA (Monarch Joint Venture 2019; USFWS 2019). In accordance with Rhode Island Natural Heritage Program (RINHP) policy, the occurrence of butterfly milkweed within these habitats will be reported to the RINHP during the state permitting process. No other federal or state-listed species; rare, threatened, or endangered species; species of greatest conservation need; or associated critical habitats, other than those discussed in Sections 3.5 and 3.7, were identified as having the potential to occur within the GAA for coastal habitats and fauna (BOEM 2022; vhb 2021).

3.8.1.1 Future Offshore Wind Activities (without Proposed Action)

Onshore Activities and Facilities

This section discloses potential coastal habitats and fauna impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

Climate change: Impacts of climate change could contribute to impacts on coastal habitats and fauna primarily according to existing global and regional climate trends. Activities that contribute to climate change are provided in the Air emissions and climate change section in Section 3.4.1.1. Although sources of GHG emissions contributing to regional and global climate change mostly occur outside the GAA for coastal habitats and fauna, these resources may be affected by climate change, sea level rise, more frequent and intense storms, and altered habitat. Although the impacts resulting from climate change on coastal habitats and fauna are uncertain, BOEM anticipates that future offshore wind activities, without the Proposed Action, could have **negligible** adverse impacts on onshore coastal habitats and fauna.

Presence of structures: In addition to electrical infrastructure, some habitat conversion may result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures as well as onshore substations and associated facilities. The general trend along the coastal region from Virginia to Maine is that port activity will increase modestly and require some conversion of undeveloped land to meet port demand and will result in permanent loss of forested habitat for local bat populations. However, the increase from future offshore wind development would be a minimal contribution in the port expansion required to meet increased commercial, industrial, and recreational demand (BOEM 2019b). The current bearing capacity of existing ports is considered suitable for wind turbines, requiring no port modifications for supporting offshore wind energy development (DOE 2014). Land disturbance for construction of onshore substations, associated facilities, and port expansion activities in the GAA is expected to result in **negligible** to **minor** adverse impacts to coastal habitat and fauna.

3.8.1.2 Conclusions

Under the No Action Alternative, coastal habitats and fauna would continue to follow current regional trends and respond to current and future environmental and societal activities. The current state of local coastal habitat and fauna resources is generally stable, although some fauna may be subject to disturbance from ongoing activities in the GAA. For example, land disturbance from onshore construction of cables and structures periodically causes temporary and permanent habitat loss, temporary displacement, injury, and mortality, resulting in small short-term impacts on certain coastal fauna species. Climate change, influenced in part by GHG emissions, is altering the seasonal timing and patterns of certain species' distribution and ecological relationships, likely causing permanent impacts of unknown intensity. Considering current conditions and the modest pace of development in the GAA, coastal fauna resources are expected to remain generally stable under the No Action Alternative.

BOEM anticipates that the impacts of ongoing activities, especially onshore construction and climate change, would be negligible. In addition to ongoing activities, planned actions other than offshore wind may also contribute to impacts on coastal habitats and fauna. Planned actions other than offshore wind primarily consist of increasing onshore construction, although no future construction projects were identified within the GAA. BOEM anticipates that the impacts of planned actions other than offshore wind would be **negligible** adverse.

If any onshore components of future offshore wind activities overlap the GAA, impacts such as displacement, mortality, and/or habitat loss would be similar to those resulting from the proposed Project alone. Considering all the IPFs together, BOEM anticipates that the overall impacts associated with future offshore wind activities combined with ongoing activities, reasonably foreseeable environmental trends, and planned actions other than offshore wind in the GAA would result in **negligible** to **minor** adverse impacts, primarily through onshore construction (most are attributable to ongoing activities) and climate change.

3.8.2 Environmental Consequences

3.8.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

This assessment analyzes the maximum-case scenario; however, there is the potential for variances in the proposed Project build-out, as defined in the PDE (see Appendix D). The Project design parameters that would influence the magnitude of the impacts on coastal habitats and fauna include the location of the OnSS and ICF, the location of construction within the landfall work area and within the transmission cable envelope, and the time of year during which construction occurs. For example, the summer and fall months (May through October) constitute the most active season for coastal fauna in this area, especially reptiles and amphibians. Therefore, construction during months in which coastal fauna are not present, not breeding, or less active would have fewer impacts than construction during more active times.

The following EPMs would be implemented to minimize potential impacts to coastal habitats and fauna:

- Revolution Wind evaluated siting alternatives for the OnSS using the criteria that included avoidance or minimization of disturbance to ecologically sensitive areas.
- The OnSS and ICF would be located on parcels that are already highly altered and include buried demolition waste.
- The transmission cable would be located primarily in unvegetated and previously disturbed or developed ROWs.

These EPMs would be implemented across all alternatives; therefore, BOEM would not expect measurable potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for coastal habitats and fauna across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Table E2-1 in Appendix E1. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

Table 3.8-2 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action.

The Conclusion section within each alternative analysis discussion includes rationale for the overall effect call determination for that alternative. The overall impact of any alternative would be **minor** adverse because the effects on coastal habitats and fauna would be small, and the resource would be expected to recover completely, with no mitigation required.

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Table 3.8-2. Alternative Comparison Summary for Coastal Habitats and Fauna

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTGs	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Climate change	**Onshore**: Impacts of climate change could contribute to impacts on coastal habitats and fauna primarily according to existing global and regional climate trends. Although the impacts resulting from climate change on coastal habitats and fauna are uncertain, BOEM anticipates that future offshore wind activities, without the Proposed Action, could have **negligible** adverse impacts on onshore coastal habitats and fauna.	**Onshore**: Climate change would contribute to impacts on coastal habitats and fauna primarily according to existing global and regional climate trends. The Proposed Action could contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce climate change impacts. Although the impacts resulting from climate change on coastal habitats and fauna are uncertain, BOEM anticipates that the Proposed Action would have no measurable influence on climate change and therefore the resulting impacts to coastal habitats and fauna would be **negligible** adverse. No additional impacts from climate change beyond those discussed under the impacts analysis for construction and installation are expected during O&M and Project decommissioning. The types of cumulative impacts from global climate change to coastal habitats and fauna described under the No Action Alternative would occur under the Proposed Action. However, the Project could also contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce climate change impacts (although effects would still be **negligible** to **minor** adverse).	**Onshore**: Alternatives C through F would not alter impacts to onshore activities. Therefore, construction, O&M and Project decommissioning impacts would be the same as those described for the Proposed Action: **negligible** adverse. Cumulative impacts would also be the same as those described for the Proposed Action: **negligible** to **minor** adverse.			
Presence of structures	**Onshore**: In addition to electrical infrastructure, some habitat conversion may result from port expansion activities required to meet the demands for fabrication, construction, transportation, and installation of wind energy structures as well as onshore substations and associated facilities. Land disturbance for construction of onshore substations, associated facilities, and port expansion activities in the GAA is expected to result in **negligible** to **minor** adverse impacts to coastal habitat and fauna.	**Onshore**: The operational footprints of the OnSS and ICF would create habitat loss when forested upland is cleared and replaced with hard structures and crushed gravel yards that are not capable of supporting plants or wildlife. The ICF would result in a loss of approximately 1.6 acres of mixed oak/white pine forest, which is reflective of the operational footprint of the ICF. The OnSS would result in a loss of 3.8 acres of mixed oak/white pine forest. Together, these losses represent a relatively small fraction of the 52 acres of contiguous habitat identified in the RIWAP (vhb 2021) and represent a **negligible** to **minor** adverse impact to coastal habitats. Overall, the habitat loss that would result from the construction of the OnSS and ICF would be considered negligible because this loss would be small relative to the unimpacted similar habitat in the general region. At the OnSS and ICF, land disturbance in the form of vegetation management would occur on a periodic basis to maintain vegetation at shrub height. Presence of structures as it relates to vegetation clearing may result in the direct injury or mortality of wildlife as well as habitat alteration or removal. Impacts from vegetation management may include reduction in habitat quality via the spread of invasive species and temporary displacement of individuals. However, the spread of invasive species would be controlled with periodic vegetation management, and wildlife displacement could occur only during vegetation removal activities. The impact of habitat degradation and wildlife displacement resulting from vegetation management of the OnSS and ICF is expected to be short term **negligible** adverse. The impact of habitat degradation and/or loss, wildlife displacement, and wildlife injury and/or mortality resulting from land disturbance during decommissioning of the OnSS and ICF would be short term **negligible** adverse. Because of the small amount of affected onshore habitat, land disturbance from the Proposed Action when added to other past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts to coastal habitats and fauna.	**Onshore**: Alternatives C through F would not alter impacts to onshore activities. Therefore, construction, O&M and Project decommissioning impacts would be the same as those described for the Proposed Action: **negligible** to **minor** adverse. Cumulative impacts would also be the same as those described for the Proposed Action: **negligible** to **minor** adverse.			

Note: Each cell includes analysis for the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

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3.8.2.2 Alternative B: Impacts of the Proposed Action on Coastal Habitats and Fauna

3.8.2.2.1 Construction and Installation

Onshore Activities and Facilities

Climate change: Climate change would contribute to impacts on coastal habitats and fauna primarily according to existing global and regional climate trends. Although sources of GHG emissions contributing to regional and global climate change mostly occur outside the GAA for coastal habitats and fauna, these resources may be affected by climate change, sea level rise, more frequent and intense storms, and altered habitat. The Proposed Action could contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce climate change impacts. Although the impacts resulting from climate change on coastal habitats and fauna are uncertain, BOEM anticipates that the Proposed Action would have no measurable influence on climate change and therefore the resulting impacts to coastal habitats and fauna would be **negligible** adverse.

Presence of structures: The OnSS would occupy an operational footprint measuring up to 3.8 acres and would connect to the ICF with two 115-kV underground transmission cables up to 527 feet long. Additionally, the OnSS would include a compacted gravel driveway, stormwater management features, and associated landscaped or managed vegetated areas totaling up to 7.1 acres inclusive of the up-to-4-acre operational footprint of the facility. The adjacent ICF would have an operational footprint of 1.6 acres and would also include a paved access road, stormwater management features, and associated landscaped or managed vegetated areas within the approximate 4.0-acre construction footprint. Construction of these facilities would result in habitat loss and habitat conversion in the areas surrounding the RWEC, the OnSS, and the ICF. The operational footprints of the OnSS and ICF would create habitat loss when forested upland is cleared and replaced with hard structures and crushed gravel yards that are not capable of supporting plants or wildlife. The ICF would result in a loss of approximately 1.6 acres of mixed oak/white pine forest, which is reflective of the operational footprint of the ICF. The OnSS would result in a loss of 3.8 acres of mixed oak/white pine forest. Together, these losses represent a relatively small fraction of the 52 acres of contiguous habitat identified in the RIWAP (vhb 2021) and represent a **negligible** to **minor** adverse impact to coastal habitats.

In addition to impacts on the mixed oak and white pine forest, the OnSS would develop 0.6 acre of pitch pine barren. The OnSS has been designed to avoid occurrences of sickle-leaved golden aster (*Pityopsis falcata*), a plant species of state concern within Rhode Island that were observed within the pitch pine barren outside of the footprint of the OnSS (vhb 2021). In accordance with the state environmental permitting needed for the Project, the occurrence of this state-listed species must be reported to the Rhode Island DEM, which will advise if a mitigation plan will be needed. Overall, the habitat loss that would result from the construction of the OnSS and ICF would be considered negligible because this loss would be small relative to the unimpacted similar habitat in the general region. As previously described in the impacts discussion for the landfall work area, land disturbance and habitat alteration from the construction of the OnSS and ICF could cause habitat degradation through the spread of invasive species. As noted previously, invasive plant growth within the OnSS parcels is pervasive. Invasive plant species were also observed throughout the forested portion of the ICF parcel (vhb 2021). This observation indicates that invasive species are likely to become further established in these areas if proper management techniques are not followed.

3.8.2.2.2 Operations and Maintenance and Decommissioning

Onshore Activities and Facilities

Climate change: No additional impacts from climate change beyond those discussed under the impacts analysis for construction and installation described in Section 3.8.2.2.1 are expected during O&M and Project decommissioning. BOEM anticipates that the Proposed Action would have no measurable influence on climate change and therefore the resulting impacts to coastal habitats and fauna would be **negligible** adverse.

Presence of structures: At the OnSS and ICF, land disturbance in the form of vegetation management would occur on a periodic basis to maintain vegetation at shrub height. Vegetation control methods would employ integrated vegetation management practices, including manual cutting, mowing, the prescriptive use of herbicides, and the use of environmental and cultural controls (Eversource 2018). The method of control would be determined following inspections of the site scheduled for maintenance. The current maintenance cycle for vegetation control using integrated vegetation management practices is 3 or 4 years depending on the vegetation composition, facilities, and site conditions (Eversource 2018). Hazard tree removal would also be performed on a cyclical basis to inspect and remove trees that may fall that are outside the edge of maintained ROWs. Presence of structures as it relates to vegetation clearing may result in the direct injury or mortality of wildlife as well as habitat alteration or removal. Impacts from vegetation management may include reduction in habitat quality via the spread of invasive species and temporary displacement of individuals. However, the spread of invasive species would be controlled with periodic vegetation management, and wildlife displacement could occur only during vegetation removal activities. The impact of habitat degradation and wildlife displacement resulting from vegetation management of the OnSS and ICF is expected to be short term **negligible** adverse.

At the end of the Project's operational life, the OnSS and ICF would be decommissioned in accordance with a detailed Project decommissioning plan that would be developed at that time. OnSS and ICF equipment may be removed while keeping the substation yard and fencing intact. Under such a scenario, land disturbance and habitat alteration activities may be similar to those described under the construction impact analysis, although the impacts would likely be less because new vegetation clearing and grading would not be necessary. The impact of habitat degradation and/or loss, wildlife displacement, and wildlife injury and/or mortality resulting from land disturbance during decommissioning of the OnSS and ICF would be short term **negligible** adverse.

3.8.2.2.3 Cumulative Impacts

Onshore Activities and Facilities

Climate change: The types of cumulative impacts from global climate change to coastal habitats and fauna described under the No Action Alternative would occur under the Proposed Action. However, the Project could also contribute to a long-term net decrease in GHG emissions. This difference may not be measurable but would help reduce climate change impacts (although effects would still be **negligible** to **minor** adverse).

Presence of structures: Construction and installation, O&M, and decommissioning of the OnSS under the Proposed Action would contribute to the habitat conversion and habitat loss described under the No Action Alternative, potentially changing the composition and abundance of faunal assemblages through the removal of forested habitat at the OnSS and ICF. Because of the small amount of affected onshore habitat, land disturbance from the Proposed Action when added to other past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts to coastal habitats and fauna.

3.8.2.2.4 Conclusions

In summary, the activities associated with the Proposed Action may affect coastal habitats and fauna through temporary land disturbance, injury or mortality of individuals, and permanent conversion of a small proportion of the overall habitat available regionally. Considering the avoidance, minimization, and mitigation measures proposed, construction of the Proposed Action alone would likely have negligible to minor impacts on coastal habitats and fauna. The Proposed Action would contribute to the cumulative impact rating primarily through the temporary displacement, mortality, temporary to permanent habitat loss, and noise generated from construction of the OnSS and ICF. Considering all the IPFs together, BOEM anticipates that the impacts to coastal habitats and fauna from ongoing and planned actions, including the Proposed Action, would likely be **minor** adverse in the GAA because the measurable impacts expected would be small and/or the resource would likely recover completely when the impacting agent is gone and remedial or mitigating action is taken. The main drivers for this impact rating are ongoing and future land disturbance and ongoing climate change.

3.8.2.3 Alternatives C, D, E, and F

Table 3.8-2 provides a summary of IPF findings for these alternatives.

3.8.2.3.1 Conclusions

The overall impacts of Alternatives C through F to coastal habitats and fauna when combined with past, present, and reasonably foreseeable activities would be the same as under the Proposed Action: **minor** adverse.

3.8.2.4 Mitigation

No potential additional mitigation measures for coastal habitats and fauna are identified in Table F-2 in Appendix F.

3.9 Commercial Fisheries and For-Hire Recreational Fishing (see section in main EIS)

3.10 Cultural Resources (see section in main EIS)

3.11 Demographics, Employment, and Economics (see section in main EIS)

3.12 Environmental Justice (see section in main EIS)

3.13 Finfish and Essential Fish Habitat (see section in main EIS)

3.14 Land Use and Coastal Infrastructure

3.14.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Land Use and Coastal Infrastructure

Geographic analysis area: The GAA for land use and coastal infrastructure is the Town of North Kingstown, Rhode Island, and the ports potentially used for Project construction and installation, O&M, and decommissioning. The ports included as part of the GAA include port facilities and surrounding areas at Sparrow's Point, Paulsboro Marine Terminal, Port of Brooklyn, Port Jefferson, Port of Montauk, Port of New London, Port of Davisville at Quonset Point, Port of Galilee, Port of Providence, and the New Bedford Marine Commerce Terminal. The Proposed Action and other reasonably foreseeable wind energy projects may use the port facilities shown in Figure 3.14.1. While the extent of port facilities and upgrades are unknown at this time, land use impacts could occur at these 10 port facilities and surrounding areas, which is why they are included in the land use and coastal infrastructure GAA.

The GAA also includes the 18 BOEM OCS Lease Areas that range from the offshore Norfolk, Virginia, area in the south to the offshore Rhode Island area in the north (see Figure 3.14-1). Appendix E contains detailed descriptions of these port facilities and Lease Areas. These areas encompass locations where BOEM anticipates direct and indirect impacts associated with proposed onshore facilities and ports.

Affected environment: The Town of North Kingstown, one of 10 towns in Washington County, is located south of Providence, Rhode Island, and is bordered on the south by the towns of South Kingstown and Narragansett, on the north by East Greenwich, on the west by Exeter, and on the east by Narragansett Bay. North Kingstown is the second-largest Washington County town, with a population of 26,323 in 2019 (U.S. Census Bureau 2019). It is part of the Providence metropolitan area, with a land area of approximately 58 square miles.

North Kingstown is a primarily residential community characterized by a mixture of farms, natural areas, cultural centers, villages, historic districts and towns, and countryside (Interface Studio 2019). There are several unique points of interest in the town, including the Davis Memorial Wildlife Refuge, Smith's Castle, and Quonset Point, among others. Land use within the Town of North Kingstown largely comprises small areas of low-density residential enclaves surrounded by forests, brushland, and pastures. North Kingstown also contains areas with mines, quarries, and gravel pits, as well as industrial and commercial hubs. The waterfront areas of North Kingstown include transportation facilities such as the Port of Davisville at Quonset Point, open space, high-density residential, wetlands, and other uses.

The proposed RWEC landing site would be within the landfall envelope described in the COP (see COP Figure 2.2.1-3), which totals approximately 20 acres, located at the Port of Davisville at Quonset Point in North Kingstown (see COP Figure 1.1-1). The landfall envelope is generally bounded by Whitecap Drive on the west, the Electric Boat property on the east, and Circuit Drive on the north. Within the landfall envelope is a landfall work area measuring up to 3.1 acres. The landfall work area is part of The Port of Davisville at Quonset Point, which is the location of the former Naval Air Station Quonset Point. The landfall work area consists of several onshore elements:

- Up to two underground transmission circuits (called the onshore transmission cable), co-located within a single corridor
- An OnSS and ICF located adjacent to the existing Davisville Substation

- An underground ROW connecting the OnSS to the ICF (Interconnection ROW)
- An overhead ROW connecting the ICF to the Davisville Substation (TNEC ROW)

Land uses in the landfall envelope are primarily commercial and industrial. This area of the Port of Davisville at Quonset Point is part of the Quonset Business Park and contains several large businesses, including boat and pool manufacturers, medical laboratories, distribution centers, lumber distributors, and office space, among others (SO Rhode 2014). The landfall envelope area contains a few manufacturing and industrial buildings, associated parking lots, and access roads. Blue Beach, a public beach, is approximately 500 feet west of the southwest corner of the landfall envelope. Blue Beach is accessed via a trail located to the west of the Hayward Industries, Inc., building, which is just outside the landfall envelope. Compass Rose Beach, another public beach, is approximately 2,600 feet east of the southeast corner of the landfall envelope. The Martha's Vineyard Fast Ferry dock is located directly east of Compass Rose Beach. The eastern edge of the Quonset State Airport is also approximately 2,600 feet east of the landfall envelope. The North Kingstown Golf Course is approximately 2,000 feet north of the northern edge of the landfall envelope and is separated from the landfall envelope by Roger Williams Way.

Regardless of the landfall site selected, The preferred onshore transmission cable route is an approximate 1-mile (1.6-km) route that will predominantly follow along paved roads or previously disturbed areas such as parking lots. There are alternative onshore transmission cable routes under consideration within the onshore transmission cable envelope, as depicted on Figure 4.3.1-2 in the COP. Some of the routes under consideration have segments that would be installed in undeveloped, vegetated areas within parcels 179-003 and 179-005 (the Davisville Substation parcel), although most would be installed within paved roads and parking lots, as with the preferred onshore transmission cable route, and would be approximately the same length. Regardless of the exact route chosen, impact determinations would not be affected for any IPF (COP Figure 4.3.1-2). Land uses around the onshore Project footprint consist of low-density residential, commercial, public lands on the south side of Camp Avenue, and other commercial and industrial uses. There are two public beaches in the Project vicinity, Blue Beach and Compass Rose Beach, as well as three small schools. Based on the Town of North Kingstown's Assessors' Data (Interface Studio 2019), the segment of the RWEC from the mean high water level to the transition joint bays (TJBs), landfall work area, and onshore transmission cable are located within an area that is predominantly industrial but also consists of some large business commercial, low-medium residential (including single-family residences and duplexes), and undeveloped land uses. The property hosting the OnSS and ICF is surrounded by low-medium residential, medium-high-density residential, utility (i.e., the existing Davisville Substation), and undeveloped land uses. The OnSS will be located on two adjacent parcels (179-030 and 179-001) totaling 15.7 acres, both owned by the Rhode Island Commerce Corporation. The ICF will be located on an adjacent 6.1-acre parcel (179-005) owned by TNEC. COP Figure 4.6.7-1 (vhb 2022) depicts land uses in the vicinity of the onshore components of the Project.

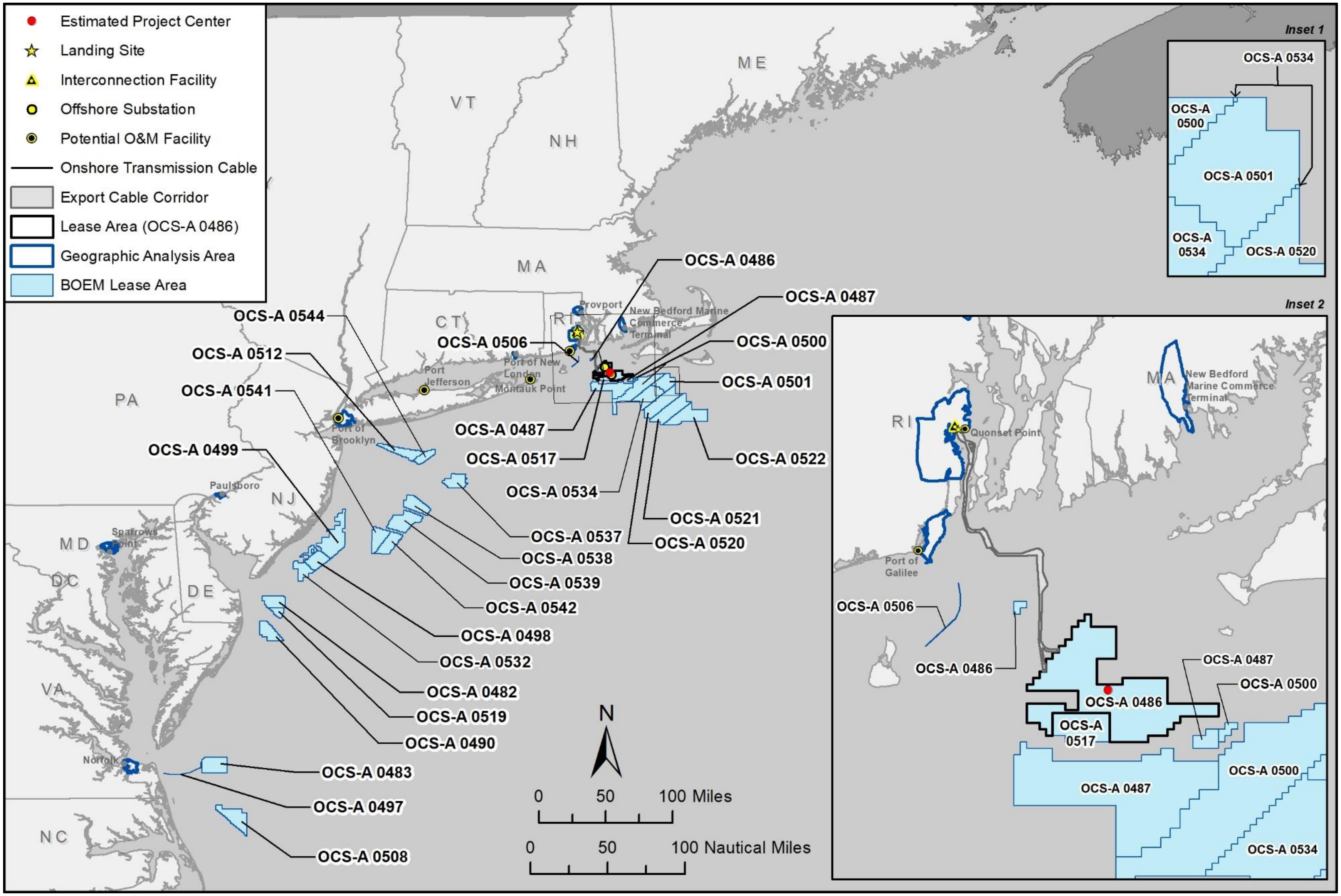

Figure 3.14-1. Geographic analysis area for land use and coastal infrastructure.

An OnSS and ICF would be constructed to support interconnection to the existing Davisville Substation, which is located within the Quonset Business Park in North Kingstown. The Davisville Substation operates at 115 kV and connects to the regional transmission grid via two 115-kV transmission tap lines. The existing substation is within North Kingstown Assessor's Plat 179 Lot 005. The OnSS location is on the north side of Camp Avenue in an area that is undeveloped. The Town of North Kingstown has designated the undeveloped area as a planned village development that is surrounded by the Quonset Business Park District (Town of North Kingstown, Rhode Island 2021a). The RWEC would enter the landfall work area underground, pass through the transition joint bays, and continue underground as the Onshore Transmission Cable to the OnSS. The connection cables running from the OnSS to the ICF would be underground. The cables connecting from the ICF to the existing Davisville Substation would be the only aboveground and overhead cables (vhb 2022).

Port of Davisville at Quonset Point, a port located in North Kingstown, is a former naval air station that was subsequently redeveloped into a modern industrial park (Interface Studio 2019). The industrial park, known as Quonset Point/Davisville Business Park, is on a peninsula in Narragansett Bay. The port is a multimodal transportation area with deepwater piers used for both shipping and ship repairs, an airport with the longest runway in the state, freight and passenger rail facilities, and interstate highway connections. The availability of a variety of industrially zoned land with full-service networks provides opportunities for new industries (Maguire Group, Inc. 2008). The Port of Davisville at Quonset Point is served by Rhode Island Route 403 and a railroad spur from Amtrak's Northeast Corridor, along with freight service provided by the Providence and Worcester Railroad. It is also the home of the Port of Davisville at Quonset Point, a golf course, four public beaches, ferry service to Martha's Vineyard, and two museums.

Other port facilities in New York, Rhode Island, Connecticut, Virginia, Massachusetts, Maryland, and New Jersey could also support construction of the RWF and offshore components of the RWEC (see COP Table 3.3.10-1). These ports are generally industrial in character and are typically adjacent to other industrial or commercial land uses and major transportation corridors. Before construction begins, Revolution Wind would finalize mobilization plans and arrangements at port facilities to support Proposed Action activities, including logistic support for fabrication, as needed (vhb 2022). See Section 3.9, Section 3.11, and Section 3.18 for discussions of recreational vessel and commercial fishing activity in these ports.

3.14.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential land use and coastal infrastructure impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E2.

<u>Accidental releases and discharges:</u> Future offshore and onshore activities could result in accidental releases of trash or water quality contaminants (see Section 3.21 for quantities and details). Trash and contaminant spills would be minimized by vessel compliance with USCG regulations. In the event of a spill, adjacent properties and coastal infrastructure could be temporarily restricted. The exact extent of restrictions and other impacts would depend on the locations of landfall, substations, and cable routes, as well as the ports used to support future offshore wind energy projects. These impacts, however, would

generally be localized and short term. On this basis, the effects of accidental releases and discharges on land use under the No Action Alternative would be long term and **minor** adverse.

New cable emplacement/maintenance: Future offshore activities could result in onshore land disturbances to accommodate supporting cable infrastructure for offshore wind development. Land disturbance impacts would largely be limited to the construction and installation phase of any such projects and would be localized in nature.

Onshore, neighboring or adjacent land to cable placement could temporarily be disturbed by future offshore wind project–related noise, vibration, and dust, as well as travel delays along impacted roads. The simultaneous construction and installation of two or more onshore development projects and/or landing sites and onshore cable routes would generate cumulative short-term impacts to land use. State and local agencies would be responsible for managing actions to help minimize and avoid noise, air quality, and other impacts on nearby neighborhoods during construction and installation. All construction and operational impacts from land disturbance would be regulated through local land use and zoning regulations and would therefore comply with applicable laws. On this basis, the effects of land disturbance on land use under the No Action Alternative would be short term and **negligible** adverse**.**

Light: Future offshore activities could result in onshore lighting associated with supporting infrastructure for offshore wind development. These lighting sources would be minor adverse and short term in nature. All construction and operational impacts from land disturbance would be regulated through local land use and zoning regulations and would therefore comply with applicable laws. On this basis, the effects of light on land use under the No Action Alternative would be long term and **minor** adverse**.**

Permanent aviation warning lighting on any offshore wind WTGs proposed as part of future offshore wind activities would be visible from south-facing beaches and coastlines. Visibility would depend on distance from shore, topography, and atmospheric conditions but would be long term. If this lighting alters visitor behavior, land use in the form of tourism, recreation, and property values could subsequently be impacted. Lighting from substations could also affect the adjacent property use and residential development. However, new substations constructed as part of future offshore wind activities would likely be constructed near existing energy infrastructure or where land development regulations, such as zoning and land use plan designations, allow such uses. Therefore, land use would not be expected to be measurably changed, nor would light itself impact land uses or alter land use patterns. On this basis, the effects of light on land use under the No Action Alternative would be long term and **minor** adverse**.**

Noise: Future offshore activities could result in onshore noise associated with clearing and grading, construction and installation of aboveground and underground utility infrastructure and impervious surfaces, and other disturbances. These noise sources would be **minor** adverse and short term in nature.

Future offshore wind activities could result in increased noise during the construction and installation phases. Given the location of these projects within the RI/MA WEA (see Figure 1.1-2), there would be no noise impacts on land use from construction and installation, O&M, and decommissioning of the offshore components of future offshore wind activities. Future offshore wind activities could result in onshore noise impacts during construction and installation, O&M, and decommissioning of onshore elements of future offshore wind activities due to increased construction, traffic, dust, vibration, and other impacts. These noise impacts would be subject to state and local noise regulations and ordinances and therefore would have limited adverse impacts on land use due to the impacts occurring under regulatory thresholds.

On this basis, the effects of noise on land use under the No Action Alternative would be long term and **negligible** adverse.

3.14.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on land use and coastal infrastructure associated with the Project would not occur. However, ongoing and future offshore wind activities would have continuing temporary to long-term impacts on land use and coastal infrastructure, primarily through onshore construction and installation and port activities.

BOEM anticipates that impacts for reasonably foreseeable offshore wind activities would be **minor** adverse. Impacts for ongoing activities and reasonably foreseeable activities other than offshore wind would be **minor** adverse, as discussed in Appendix E, Table E2-13. Accidental releases, electromagnetic fields (EMF), land disturbance, light, noise, and port utilization could have temporary adverse impacts on local land uses, but as a whole, ongoing use and development would support the region’s diverse mix of land uses and provide support for continued maintenance and improvement of coastal infrastructure.

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 **minor** adverse impacts because the overall effect would be localized and short term.

3.14.2 Environmental Consequences

3.14.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

The analysis presented in this section considers the impacts resulting from the maximum design scenario under the project design envelope (PDE) approach developed by BOEM to support offshore wind project development (Rowe et al. 2017). The maximum design size specifications defined in Appendix D, Table D-1, are PDE parameters used to conduct this analysis. Several project parameters could change during the development of the final project configuration, potentially reducing the extent and/or intensity of impacts resulting from the associated IPFs.

The following design parameters would result in reduced impacts relative to those generated by the design elements considered under the PDE:

- The use of a casing pipe method to construct the RWEC sea-to-shore transition would eliminate the need for a temporary cofferdam, resulting in less extensive acoustic and vibration impacts than vibratory pile driving to construct a cofferdam thus reducing onshore noise and vibration impacts to coastal land uses (Zeddies 2021).
- The selection of an 8-MW WTG design would reduce the total WTG height from 873 to 648 feet, reducing the visual impact of the facility on coastal land uses.
- The selection of an alternate route for the onshore component of the RWEC could alter the location and increase or decrease the extent of construction-related ground disturbance, but the nature and overall significance of these impacts on land use would remain unchanged.

See Appendix E2 for a summary of IPFs analyzed for land use and coastal resources across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Appendix E1, Table E2-13. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

Table 3.14-1 provides a summary of IPF findings carried forward for analysis. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion. This comparison considers the implementation of all EPMs proposed by Revolution Wind to avoid and minimize adverse impacts on land use. These EPMs are summarized in Appendix F, Table F-1.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component.

The Conclusion section within each alternative analysis discussion includes rationale for the effects determinations. Overall, impacts to land use and coastal infrastructure from any action alternative would be **minor** adverse because they would be small, and the resource would be expected to recover completely with no mitigating action required.

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Table 3.14-1. Alternative Comparison Summary for Land Use and Coastal Infrastructure

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Accidental releases and discharges	**Offshore**: Future offshore activities could result in accidental releases of trash or water quality contaminants (see Section 3.21 for quantities and details). These impacts, however, would generally be localized and short term. On this basis, the effects of accidental releases and discharges on land use under the No Action Alternative would be long term and **minor** adverse.	**Offshore**: Accidental releases and discharges of fuels, lubricants, and hydraulic fluids could occur during the construction and installation phase. Accidental releases would be minimized by containment and cleanup measures detailed in the Emergency Response Plan/OSRP. Therefore, there would be a **negligible** adverse impact from accidental releases and discharges on land use and coastal infrastructure. The Proposed Action and other reasonably foreseeable projects would be expected to comply with any applicable permit requirements to implement erosion, stormwater, and spill controls to minimize, reduce, or avoid impacts on water and air quality. As a result, the Proposed Action when combined with past, present, and other reasonably foreseeable projects would result in **negligible** adverse cumulative impacts on land use and coastal infrastructure because there would be no impact on land use and coastal infrastructure.	**Offshore**: Alternative C to F would require fewer vessel trips relative to the Proposed Action, reducing the risk of accidental releases and discharges from vessels. However, given the likelihood of such releases is low, the difference in level of risk would likely be undetectable. Likewise, risk of accidental releases and discharges could be slightly reduced from the reduced risk of vessel collisions/allisions. Because accidental releases and discharges in the offshore environment of the scale anticipated are not expected to measurably impact land use and coastal infrastructure, these impacts would similarly be **negligible** adverse.			
	Onshore: Future onshore activities could result in accidental releases of trash or water quality contaminants (see Section 3.21 for quantities and details). These impacts, however, would generally be localized and short term. On this basis, the effects of accidental releases and discharges on land use under the No Action Alternative would be long term and **minor** adverse.	**Onshore**: While accidental releases and discharges could impact land use and coastal infrastructure by introducing air or water quality contamination into areas undergoing construction and installation, O&M and decommissioning, it is anticipated that containment would prevent or mitigate discharges before they can impact land uses. Therefore, there would be a temporary, **negligible** adverse impact due to accidental releases and discharges on land use and coastal infrastructure.	**Onshore**: Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to land use and coastal infrastructure from accidental releases and discharges would be effectively the same as those described for the Proposed Action: **negligible** adverse.			
Light	**Offshore**: Permanent aviation warning lighting on any offshore wind WTGs proposed as part of future offshore wind activities would be visible from south-facing beaches and coastlines. However, land use would not be expected to be measurably changed, nor would light itself impact land uses or alter land use patterns. On this basis, the effects of light on land use under the No Action Alternative would be long term and **minor** adverse.	**Offshore**: There would be a temporary increase in the amount of lighting during construction and installation due to the presence of work vessels. Given that offshore elements of the Proposed Action would be located approximately 12 to 15 miles from shore, it is anticipated that there would be very little lighting impact on land use and coastal infrastructure from construction and installation of offshore elements of the Proposed Action. Therefore, there would be a temporary, **negligible** adverse light impact on land use and coastal infrastructure. During operations, offshore structures would require lighting that conforms to FAA and BOEM guidelines, and USCG requirements. The visibility of WTGs and potentially the OSSs would result in a small impact to onshore land uses and coastal infrastructure by increasing light in the offshore environment that could be visible onshore and could slightly increase visible light in coastal communities. Decommissioning impacts would be similar to impacts from the Proposed Action construction and installation. Therefore, there would be a long-term, **minor** adverse light impact on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action. The Proposed Action and other reasonably foreseeable projects would be expected to comply with applicable permit conditions and lighting requirements to minimize, reduce, or avoid light impacts on onshore land uses and coastal infrastructure. Therefore, the cumulative impact would be **negligible** adverse.	**Offshore**: While Alternatives C through F could result in a slight reduction in construction lighting, the effects of this IPF on land use and coastal infrastructure under the Habitat Alternative would otherwise be similar to those described for the Proposed Action, ranging from **negligible** adverse to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
	Onshore: Future offshore activities could result in onshore lighting associated with supporting infrastructure for offshore wind development. These lighting sources would be minor adverse and short term in nature. On this basis, the effects of light on land use under the No Action Alternative would be long term and **minor** adverse**.**	**Onshore**: Nighttime lighting could have a temporary adverse impact on land use and coastal infrastructure by increasing artificial lighting that could be visible by residences and businesses nearby. Operational lighting onshore would be limited to the OnSS and ICF. In general, lighting would be minimal and directed downward. Lighting would be removed as part of decommissioning. Therefore, there would be a long-term, **minor** adverse light impact on land use and coastal infrastructure from construction, O&M, and decommissioning of onshore elements of the Proposed Action. Temporary and permanent lighting would require compliance with local development regulations at the port facilities and locations where reasonably foreseeable future projects would experience onshore lighting impacts. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on land use and coastal infrastructure.	**Onshore:** Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to land use and coastal infrastructure from lighting would be effectively the same as those described for the Proposed Action: **minor** adverse.			
New Cable Emplacement/Maintenance	**Onshore**: Future offshore activities could result in onshore land disturbances to accommodate supporting cable infrastructure for offshore wind development. Onshore, neighboring or adjacent land to cable placement could also temporarily be disturbed by future offshore wind project–related noise, vibration, and dust, as well as travel delays along impacted roads. All construction and operational impacts from land disturbance would be regulated through local land use and zoning regulations and would therefore comply with applicable laws. On this basis, the effects of land disturbance on land use under the No Action Alternative would be short term and **negligible** adverse.	**Onshore**: All Proposed Action-related construction and installation would take place within areas zoned for industrial and commercial development and would be subject to land use and zoning regulations that limit impacts. Therefore, there would be a short-term, **minor** adverse land disturbance impact on land use and coastal infrastructure. Once installed, the onshore components of the RWEC would be located underground and disturbed areas would be restored to preconstruction conditions or improved. Due to the temporary and intermittent nature of O&M activities, O&M of onshore facilities would have a **negligible** adverse impact on land use over the 35-year lifespan of the Project. The Project and other reasonably foreseeable future projects would be required to comply with local land use and zoning regulations, which would reduce impacts to land use and coastal infrastructure. Therefore, cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on land use and coastal infrastructure.	**Onshore**: Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to land use and coastal infrastructure from new cable emplacement/maintenance would be effectively the same as those described for the Proposed Action, ranging from **negligible** adverse to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Noise	**Offshore**: Future offshore wind activities could result in increased noise during the construction and installation phases. These noise impacts would be subject to state and local noise regulations and ordinances. On this basis, the effects of noise on land use under the No Action Alternative would be long term and **negligible** adverse.	**Offshore**: While offshore noise associated with the Proposed Action construction could be audible onshore, it would be below ambient noise levels and therefore would have a minimal impact on land use and coastal infrastructure. Therefore, there would be a temporary, **negligible** adverse noise impact on land use and coastal infrastructure. There would be no noise impacts on land use and coastal infrastructure from O&M of offshore facilities. Therefore, the impact on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action would be **negligible** adverse. Noise associated with the Project and reasonably foreseeable offshore wind activities are not expected to generate noise levels that would be audible onshore. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be **negligible** adverse.	**Offshore**: Under Alternatives C through F, fewer monopiles would be constructed and installed. While Alternatives C through F could result in a slight reduction in construction noise, the effects of this IPF on land use and coastal infrastructure would otherwise be similar to those described for the Proposed Action. Therefore, the impact on land use and coastal infrastructure would be **negligible** adverse, which is the same impact determination as the Proposed Action.			
	Onshore: Future offshore activities could result in onshore noise associated with clearing and grading, construction and installation of aboveground and underground utility infrastructure and impervious surfaces, and other disturbances. These noise sources would be **minor** adverse and short term in nature.	**Onshore**: Noise and traffic would result from construction and installation of the onshore facilities. EPMs would minimize, but not eliminate, noise effects on surrounding land uses. However, these effects would be short term and generally consistent with noise impacts associated with general development under zoned land uses (vhb 2021b). Therefore, there would be short term, **minor** adverse noise impact on land use and coastal infrastructure from construction and installation of onshore elements of the Proposed Action. Noise generated by onshore facilities and O&M and decommissioning activities would be managed under existing local ordinances and regulations as permitted for the approved zoning. As such, noise impacts on land use from the O&M and decommissioning of onshore facilities would have a **negligible** adverse effect on land use. It is expected that noise impacts generated by other planned and foreseeable future actions would similarly be consistent with local ordinances applicable to zoned land uses. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would have a **negligible** adverse effect on land use and coastal infrastructure.	**Onshore**: Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to land use and coastal infrastructure from noise would be effectively the same as those described for the Proposed Action, ranging from **negligible** adverse to **minor** adverse.			

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3.14.2.2 Alternative B: Impacts of the Proposed Action on Land Use and Coastal Infrastructure

3.14.2.2.1 Construction and Installation

Offshore Activities and Facilities

Accidental releases and discharges: Accidental releases and discharges of fuels, lubricants, and hydraulic fluids could occur during the construction and installation phase. These impacts are covered in Section 3.21. A draft OSRP has been prepared for the Project and consists of processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills. A release during construction and installation of the Proposed Action would generally be localized, short term, and **minor** adverse, resulting in little change to water quality.

Offshore accidental releases and discharges during construction and installation would not result in land use and coastal infrastructure impacts, as incorporation of water quality EPMs described in Appendix F would aid in reducing the chances of accidental releases and discharges; accidental releases and discharges would be contained and mitigated according to federal, state, and local law. Applicable EPMs in Appendix F include compliance with regulatory requirements related to the prevention and control of spills and discharges, implementation of an OSRP to manage accidental spills or releases of oils or other hazardous materials, and compliance with USCG and EPA regulations. Therefore, potential offshore accidental releases and discharges would be unlikely to result in onshore land use and coastal infrastructure impacts, as these impacts would be mitigated prior to any impacts affecting onshore resources. Therefore, there would be a **negligible** adverse impact from accidental releases and discharges on land use and coastal infrastructure during construction and installation of offshore elements of the Proposed Action, as there would be no effect from offshore accidental releases and discharges on land use and coastal infrastructure.

Light: There would be a temporary increase in the amount of lighting during construction and installation due to the presence of work vessels. In general, lights would be required on offshore platforms and structures, vessels, and construction equipment during construction and installation of the RWF. In addition, temporary work lighting would illuminate work areas on vessel decks or service platforms of adjacent WTGs or OSS platforms during nighttime construction. Project construction lighting would meet USGS requirements, when required by federal regulations.

The RWEC would also require USCG-approved navigation lighting for all vessels during construction and installation of the RWEC. All vessels operating between dusk and dawn would be required to turn on navigation lights. Cable laying could occur 24 hours a day during certain periods, and these vessels would be illuminated at night for safe operations. Given that offshore elements of the Project would be located approximately 12 to 15 miles from shore, it is anticipated that there would be very little lighting impact on land use and coastal infrastructure from construction and installation of offshore elements of the Project. Therefore, there would be a temporary, **negligible** adverse light impact on land use and coastal infrastructure from construction and installation of offshore elements of the Proposed Action.

Noise: Construction and installation of offshore elements of the Project would result in increased noise. The proposed Project would be approximately 15 miles west of the Town of New Shoreham, Rhode Island, (Block Island) and 15 to 20 miles south of several other coastal towns in Rhode Island including South Kingstown, Narragansett, Jamestown, Newport, Middletown, and Little Compton. The Project would be approximately 12 miles east/southeast of Martha's Vineyard, Massachusetts, and 13 to 16 miles south of other coastal towns in Massachusetts such as Westport, Dartmouth, and Gosnold. The maximum pile-driving noise from construction and installation of offshore Project elements audible from coastal towns would be 11.2 dBA, which is below ambient noise levels at towns in the vicinity, which range from 25 to 45 dBA during the night and 35 to 55 dBA during the day (vhb 2020). While offshore noise associated with the Proposed Action could be audible onshore, it would be below ambient noise levels and therefore would have a minimal impact on land use and coastal infrastructure. Therefore, there would be a temporary, **negligible** adverse noise impact on land use and coastal infrastructure from construction and installation of offshore elements of the Proposed Action.

Onshore Activities and Facilities

Accidental releases and discharges: Installation of the RWEC at the landfall location would use an HDD approach to install the cables under the beach and intertidal water areas. The use of drilling fluid, which typically consists of a water and bentonite mud mixture or another non-toxic drilling fluid, would be required. Bentonite is a natural clay that is mined from the earth. While these fluids are considered non-toxic, Revolution Wind would implement applicable EPMs listed in Appendix F during construction to minimize potential releases of the drilling fluid associated with HDD activities.

Solid wastes and construction debris would be generated predominately during construction and installation of onshore facilities. Per requirements outlined in 30 CFR 585.626, maximum quantities of and disposal methods for liquids and solid wastes, including hazardous materials, are summarized in COP Section 3.3.9.4 for construction. COP Table 3.3.1-2 also outlines maximum quantities of disposal methods for liquids and solid wastes, including hazardous materials for the OnSS. A spill prevention control and countermeasures plan would be developed in support of NPDES compliance and the potential for discharges and releases from onshore construction and installation would be governed by Rhode Island regulations and the Project's COP. It is anticipated that construction and installation of the OnSS would generate approximately 3,000 cy of solid waste that would be disposed of in a landfill and/or recycling center (vhb 2022).

In accordance with applicable federal, state, and local laws, comprehensive measures would be implemented prior to and during construction and installation activities to avoid, minimize, and mitigate impacts related to trash and debris disposal. Construction and installation of onshore elements could result in accidental releases and discharges of solid wastes and construction debris that could impact land use; however, the Project would implement applicable EPMs (see Appendix F) and comply with federal, state, and local regulations to reduce the impacts to land use and coastal infrastructure. Some of the EPMs listed in Appendix F include containing drilling fluids for later reuse, creating an HDD contingency plan and SESC plan, and compliance with the RIPDES General Permit for Stormwater Discharges associated with Construction Activities.

While accidental releases and discharges could impact land use and coastal infrastructure by introducing air or water quality contamination into areas undergoing construction and installation, it is anticipated that containment measures outlined above would prevent or mitigate discharges before they can impact land uses. Therefore, there would be a temporary, **negligible** adverse impact due to accidental releases and discharges on land use and coastal infrastructure from construction and installation of onshore elements of the Proposed Action.

New cable emplacement/maintenance: Airborne noise, vibration and dust, and increased vehicle traffic associated with construction and installation of the RWEC landing site and onshore export cable components would temporarily disturb neighboring land uses along the RWEC route. Portions of the development footprint could also be fenced and inaccessible at various points during construction and installation. Construction and installation activities causing these impacts consist of HDD for the RWEC, preparation and installation of TJBs that connect the RWEC and onshore transmission cable, and installation of the onshore transmission cable.

The onshore transmission cable would be installed within an underground duct bank between the TJBs and the OnSS and would be installed within or along previously disturbed areas including the shoulders of existing public roadways, lands owned by Quonset Development Corporation, and private properties. The onshore transmission cable would result in 3.1 acres (1.3 hectares) of land disturbance but would be located outside wetlands and other waterbodies. The landfall work area would require clearing, grading, and hardening to support the installation of the TJBs and would temporarily result in up to 3.1 acres (1.3 ha) of land disturbance. The TJBs would be excavated and installed underground within the landfall work area and access inside the TJBs would be provided by manholes. Therefore, land disturbance associated with the TJB area would be temporary. As discussed above, the onshore transmission cable, landfall work area, and TJBs would result in temporary impacts only. In addition, work would be sited in uplands and all activities would be conducted in compliance with the RIPDES General Permit for the Discharge of Stormwater Associated with Construction Activities and an approved SESC plan. Therefore, with the implementation of the EPMs outlined in Appendix F, land disturbance activities during construction and installation of the onshore transmission cable are expected to result in direct and short-term water quality impacts (vhb 2022).

Construction and installation of the Project's onshore components would require construction staging in parking lots adjacent to or near the landing site. While most of the construction staging would occur on private property, construction could reduce public parking available at the Blue Beach parking lot during construction and installation. These disturbances would be short term, with construction expected to begin in Quarter 1 of 2023 and last approximately 8 months (see COP Section 3.2). Construction along public roadways would be completed in a matter of days or weeks. At the landing site, the Project would make the physical connection between the offshore RWEC and the onshore RWEC in two underground TJBs. The only long-term, visible components of the cable system would be the manhole covers (vhb 2021a).

Onshore construction and installation would include trench excavation and placement of the onshore RWEC within existing paved roads. Revolution Wind would abide by local construction ordinances. Construction and installation would occur primarily during normal daylight hours except for certain activities associated with cable installation at the chosen landing site (vhb 2021a) that could require nighttime activity to meet rapid construction timelines and to reduce the chances of equipment failure. Revolution Wind would work with the Town of North Kingstown to develop a detailed plan that includes traffic and other control measures prior to beginning major construction. The traffic plan with North Kingstown would identify appropriate alternative routes that would accommodate projected traffic loading during construction and installation activities. BOEM assumes that the Project would avoid permanent disruption to existing underground utilities, such as water, sewer, and electrical lines. However, depending on the exact placement of the onshore RWEC cable, the physical size and location of the cable could hamper future installation of public utilities such as water, sewer, and stormwater lines, which are typically placed beneath roadway travel lanes. Vehicular and construction equipment emissions would be similar to those described for offshore development. The potential impacts from construction and diesel-generating equipment would be reduced through EPMs related to fuel-efficient engines and dust control plans, as outlined in Section 3.4.1.

All Project-related construction and installation would take place within areas zoned for industrial and commercial development and would be subject to land use and zoning regulations that limit impacts. Therefore, there would be a short-term, **minor** adverse land disturbance impact on land use and coastal infrastructure from construction and installation of onshore elements of the Proposed Action.

Light: Most onshore construction and installation would be completed during daytime hours. Typical construction work hours for the Project would be 7:00 a.m. to 6:00 p.m. Monday through Friday when daylight permits and 7:00 a.m. to 5:00 p.m. on Saturdays. This is consistent with the Town of North Kingstown noise ordinance (Town Code Article VI). However, some work tasks, such as concrete pours, landfall installation, and cable pulling or splicing, once started, require completion without interruption and could go beyond normal work hours. In addition, the nature of transmission line construction and installation requires line outages for certain procedures such as transmission line connections, equipment cutovers, or stringing under or over other transmission lines. These outages are dictated by ISO New England and can be very limited based on regional system load and weather conditions. Work requiring scheduled outages and crossings of certain transportation and utility corridors may be required on a limited basis outside of normal work hours, including Sundays and holidays.

For nighttime construction and installation work, portable floodlights with a maximum height of approximately 18 feet would be used. All lights on portable lightstands would be downward facing. Any nighttime lighting used during construction and installation would comply with safety and security and local requirements.

Construction equipment, the OnSS, ICF, and structures within the TNEC ROW would be visible during construction and installation. Although construction is expected to take place primarily during the daylight hours between 7:00 a.m. and 6:00 p.m., some temporary lighting may be required outside those hours. Certain activities associated with cable installation at the chosen landing site (vhb 2022) could require nighttime activity and lighting to meet rapid construction timelines and to reduce the chances of equipment failure. Nighttime lighting could have a temporary adverse impact on land use and coastal infrastructure by increasing artificial lighting that could be visible by residences and businesses nearby. Therefore, there would be a temporary, **minor** adverse light impact on land use and coastal infrastructure from construction and installation of onshore elements of the Proposed Action.

Noise: Noise and traffic would result from construction and installation of the onshore facilities. As described within the Onshore Acoustic Assessment in COP Appendix P2, long-term ambient sound measurements conducted within the proposed layout of the onshore facilities ranged from 44 to 45 dBA (Leq) at night (10:00 p.m. to 7:00 a.m.) and 49 to 50 dBA during the day (7:00 a.m. to 10:00 p.m.) (vhb 2021b). Operation of construction equipment and construction-related traffic would increase the ambient noise between the typical construction hours of 7:00 a.m. and 6:00 p.m. during the approximately 1-year construction period. The onshore facilities construction noise sources would include equipment used to support the HDD operations at the landfall work area, equipment used to support trenching and cable pulling, and construction vehicles such as excavators, dump trucks, and paving equipment (vhb 2021b).

Temporary construction and facility installation noise would be consistent with noise sources typically associated with a working industrial park. Short-term construction noise impacts would be generated during HDD onshore for the RWEC. A cofferdam could be used to ensure a dry environment during construction and installation and to manage sediment and would align with HDD exit pits. If the cofferdam is required, the cofferdam could be installed as either a sheet piled structure into the seafloor or a gravity cell structure placed on the seafloor using ballast weight. If the cofferdam is installed using sheet pile, a vibratory hammer would be used to drive the sidewalls and endwalls into the seafloor. Installation of the sheet pile cofferdam could take approximately up to 14 days. Noise associated with possible sheet pile installation would produce the maximum amount of noise compared to other construction methods. In general, noise generated by RWEC construction and installation activities would occur during daytime hours (7:00 a.m. to 8:30 p.m.), and would be largely generated by an excavator, crane, and sheet pile driver. If the HDD methodology is selected for construction of the RWEC, HDD operations would occur continuously to minimize the risk of soil settlement and equipment failures and would create noise during nighttime hours (vhb 2021b). Noise generated by construction and installation activities is expected to comply with the Town of North Kingstown noise code. The closest residences to the construction and installation of the onshore transmission cable, ICF, and OnSS are the residences on the south side of Camp Avenue and east side of Mill Creek Drive, which are within a few hundred feet of the construction area. The Onshore Acoustic Assessment (vhb 2021b) analyzed onshore construction noise and found that sound levels around the onshore transmission cable, ICF, and OnSS would be between 40 and 45 dB at residences along the south side of Camp Avenue and east side of Mill Creek Drive, which would be below ambient levels, measured between 44 and 45 dBA (Leq) at night and 49 to 50 dBA during the day at the time of the analysis.

During construction and installation of the onshore elements of the RWEC, construction noise could approach or exceed the Town of North Kingstown’s noise code limit for construction and installation activities at receptors immediately adjacent to the road ROW. EPMs for onshore construction and installation activities include coordination with local governments and compliance with appropriate local ordinances governing noise, light, and traffic impacts consistent with zoned land uses (see Appendix F). These EPMs would minimize, but not eliminate, noise effects on surrounding land uses. However, these effects would be short term and generally consistent with noise impacts associated with general development under zoned land uses. Therefore, there would be short term, **minor** adverse noise impact on land use and coastal infrastructure from construction and installation of onshore elements of the Proposed Action.

3.14.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Accidental releases and discharges: The WTGs and OSSs would be designed to contain any potential leakage of fluids, thereby preventing the discharge fluids into the ocean. During WTG operations, small accidental leaks could occur because of broken hoses, pipes, or fasteners. During WTG maintenance, small releases could occur during servicing of hydraulic units or gearboxes. Any accidental leaks within the WTGs would be contained within the hub and main bed frame or tower. During operations, the only discharges to the sea that are anticipated are those associated with vessels performing maintenance. (see Appendix D of the COP) (vhb 2022). Decommissioning impacts would be similar to construction and installation impacts discussed above. Any offshore leakage of fluids would not impact land use and coastal infrastructure due to the design feature of WTGs to capture accidental releases and discharges and because implementation of EPMs in Appendix F would minimize the potential for spills. Therefore, there would be a **negligible** adverse impact from accidental releases and discharges on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action.

Light: During operations, offshore structures would require lighting that conforms to FAA and BOEM guidelines, and USCG requirements. BOEM has indicated that offshore lighting should meet standard specifications in FAA Advisory Circulars 70/7460-1L, Change 2 (FAA 2018), and 150/5345-43H (FAA 2016), and USCG standards for marine navigation lighting.

Lighting associated with the Proposed Action would follow lighting and marking design parameters as identified in BOEM's Draft Proposed Guidelines for Providing Information on Lighting and Marking of Structures Supporting Renewable Energy Development, released April 2021 (BOEM 2021). Control, lighting, marking, and safety systems would be installed on each WTG; the specific systems would vary depending on the turbine selected and would be reviewed as part of the federal approval process.

Offshore turbines must be visible not only to pilots in the air, but also mariners navigating on water. In daylight, offshore wind turbines do not require lighting if the tower and components are painted white. The FAA and USCG consider white-colored turbines to be the most effective early warning technique for both pilots and mariners (Patterson 2005). Marine navigation lighting is regulated by the USCG through 33 CFR 67. Structures must be fitted with lights for nighttime periods. The OSSs would be lit and marked in accordance with FAA and USGS requirements for aviation and navigation obstruction lighting, respectively. Lighting on the RWEC during the O&M phase would be short term and limited to the lighting required on vessels while operating along the corridor. As described above for RWF construction and installation, USCG-approved navigation lighting is required for all vessels operating between dusk and dawn.

While WTGs and the OSSs would be lit, only a relatively small portion of the onshore locations would have open views of the Project. A viewshed analysis of the Project determined that only 44.9 square miles of land within the 6,113 square mile Visual Study Area could have potential views of the Project from ground level (EDR 2021). The visibility of WTGs and potentially the OSSs would result in a small impact to onshore land uses and coastal infrastructure by increasing light in the offshore environment that could be visible onshore and could slightly increase visible light in coastal communities. Decommissioning impacts would be similar to impacts from Project construction and installation. Therefore, there would be a long-term, **minor** adverse light impact on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action.

Noise: There would be no noise impacts on land use and coastal infrastructure from O&M of offshore facilities. Operational noise would not be audible onshore. Decommissioning impacts would be similar to impacts from Project construction and installation. Therefore, because there would be no effect, the impact on land use and coastal infrastructure from O&M and decommissioning of offshore elements of the Proposed Action would be **negligible** adverse.

Onshore Activities and Facilities

Accidental Releases and Discharges: The OnSS and ICF would require various oils, fuels, and lubricants to support its operations (see COP Table 3.3.1-2 and COP Table 3.3.1-3). Equipment would be mounted on concrete foundations with concrete secondary fluid containment designed for 110% containment and in accordance with industry and local utility standards. With EPMs, accidental release and discharge impacts to land use and coastal infrastructure from onshore O&M would be minimal. Decommissioning would incur similar impacts to those during the construction and installation phase. Therefore, there would be a temporary, **negligible** adverse impact from accidental releases and discharges on land use and coastal infrastructure from O&M and decommissioning of onshore elements of the Proposed Action due to implementation of containment measures and compliance with industry and utility standards.

<u>New cable emplacement/maintenance:</u> Once installed, the onshore components of the RWEC would be located underground and disturbed areas would be restored to preconstruction conditions or improved. Buried Project features would have no effect on adjacent land uses or coastal infrastructure. Revolution Wind has designed the Project to account for site-specific oceanographic and meteorological conditions within the analysis area, effectively avoiding the potential for beach erosion to expose the RWEC at the sea to shore transition zone.

Due to the temporary and intermittent nature of O&M activities, O&M of onshore facilities would have a **negligible** adverse impact on land use over the 35-year lifespan of the Project.

Impacts during decommissioning would be similar to the impacts during construction and installation. For onshore decommissioning, any removal of the underground, onshore cables (if not decommissioned in place) could result in temporary construction disturbances and delays along the affected roads and near the landing sites. The length and extent of these delays would be shorter in duration compared to those experienced during installation. However, all O&M activities would be consistent with local land use and zoning regulations and would be typical activities associated with industrial and commercial land uses. Therefore, there would be a temporary, **negligible** adverse land disturbance impact on land use and coastal infrastructure from decommissioning of onshore elements of the Proposed Action.

<u>Light:</u> Operational lighting onshore would be limited to the OnSS and ICF. Lighting at these facilities include 1) yard lighting and 2) task lighting. Both categories would be switched lights and would only be used during yard-based activity. The mounting heights for the lighting would range from 10 to 25 feet off the ground and the lights would be mounted on lamp posts, substation buildings, fire walls, or steel substation structures. The wattage for the individual lamps would range from 35 watts to 300 watts depending on the use. Operational lighting for the OnSS and ICF would comply with Quonset Development Corporation lighting regulations and are mounted with the lamp horizontal to the ground (light facing straight down) or with a lamp tilt no more than 25° from the horizon. The task lighting at both the OnSS and ICF would support emergency maintenance or repairs to the station equipment outside of normal business hours. The task lights would be mounted to direct light toward substation equipment to ensure adequate lighting for workers to perform emergency maintenance or repairs.

Considering the presence of an existing electrical substation and industrial uses of the area, new lighting associated with the OnSS and ICF could adversely affect residences directly adjacent to these facilities. These effects could be reduced through the use of EPMs such as visual screening. Lighting for the OnSS and ICF would be designed to the minimum standard necessary for substation safety and security per utility operational requirements, as well as state and local regulations. General yard lighting would be provided within the OnSS and ICF area for assessment of equipment. In general, yard lighting would be off at night unless lighting is necessary for in-progress site work or for safety and security.

In general, lighting would be minimal and directed downward. Lighting would be removed as part of decommissioning. Therefore, there would be a long-term, **minor** adverse light impact on land use and coastal infrastructure from O&M and decommissioning of onshore elements of the Proposed Action.

Noise: Operational noise of the underground cables is expected have no impacts to current land uses because there would be no permanent noise-generating equipment associated with the onshore transmission cable. The OnSS and ICF, as designed, would generate sound similar to or below existing ambient sound levels; therefore, operational noise levels would have a direct but small impact on land use and coastal infrastructure. The proposed OnSS would introduce new sources of sound including transformers, shun reactors, harmonic filters, and cooling and ventilation associated with the outdoor substation equipment, as well as condensers, pumps, skids, and auxiliary transformers associated with the synchronous condenser building. Sound from the substation would be 43.9 dBA or lower at the closest noise sensitive receptors, which would be below the EPA guideline for noise exposure (48.6 dBA Leq) and below the Town of North Kingston, Rhode Island, nighttime noise ordinance limit for residential properties (50 dBA). Operational sound from the OnSS would also be below 50 dBA at the nearest residential property lines and below 70 dBA at the nearest commercial/industrial property lines, which is below the noise ordinance noise limits (vhb 2021b). O&M vehicles and certain maintenance activities performed during O&M could also periodically generate noise audible to surrounding land uses throughout the life of the Project; generated noise would be similar to typical traffic noise and noise from general construction and installation activities. These continuous and intermittent impacts would be permanent. Noise generated by onshore facilities and O&M activities would be managed under existing local ordinances and regulations as permitted for the approved zoning. As such, noise impacts on land use from the O&M of onshore facilities would have a **negligible** adverse effect on land use. Decommissioning would generate noise similar to that during the construction and installation phase. Therefore, there would be a long-term **negligible** adverse noise impact on land use and coastal infrastructure from O&M and decommissioning of onshore elements of the Proposed Action.

3.14.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Accidental releases and discharges: The Proposed Action and other reasonably foreseeable future projects could result in accidental release of contaminants, trash, and debris that could add to releases from other reasonably foreseeable projects. The combined offshore accidental release impacts on land use and coastal infrastructure could increase the risk of and potential impacts from accidental releases in the GAA. The Proposed Action and other reasonably foreseeable projects would be expected to comply with any applicable permit requirements to implement erosion, stormwater, and spill controls to minimize, reduce, or avoid impacts on water and air quality. Land use and coastal infrastructure would be unlikely to be impacted by offshore accidental releases, as accidental releases would be mitigated offshore. As a result, the Proposed Action when combined with past, present, and other reasonably foreseeable projects would result in **negligible** adverse cumulative impacts on land use and coastal infrastructure because there would be no impact on land use and coastal infrastructure.

Light: The Proposed Action would add permanent lighting for up to 102 WTGs and two OSSs. Although this lighting would be visible, in part, from south-facing beaches and coastlines, this represents a small but noticeable (3%) increase over total estimated WTG and OSS foundations providing long-term lighting under the No Action Alternative if all projected offshore wind projects are constructed. BOEM estimates a maximum cumulative total of 3,110 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects. The land use impacts from the Proposed Action in the context of reasonably foreseeable future actions would be more extensive than impacts for the Proposed Action alone. However, the Proposed Action and other reasonably foreseeable projects would be expected to comply with applicable permit conditions and lighting requirements to minimize, reduce, or avoid light impacts on onshore land uses and coastal infrastructure. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be similar to those impacts described under the No Action Alternative and would be **negligible** adverse impacts.

Noise: There would be no noise impacts on land use and coastal infrastructure from offshore facilities. Noise associated with construction and installation, O&M, and decommissioning would not be audible onshore. Similarly, reasonably foreseeable activities are not expected to generate noise levels that would be audible onshore. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be similar to those impacts described under the No Action Alternative, which are described as having no onshore impacts from offshore facilities and would be **negligible** adverse impacts.

Onshore Activities and Facilities

Accidental releases and discharges: Installation of the RWEC at the landfall location would use an HDD approach to install the cables under the beach and intertidal water areas. Discharge of drilling fluids, solid wastes, and construction debris is possible during construction and installation. Additionally, discharge of oils, fuels, and lubricants is possible at the OnSS and ICF during Project operations and during maintenance activities. The Project would implement EPMs (see Appendix F) and comply with federal, state, and local regulations to reduce the impact to land use and coastal infrastructure. Reasonably foreseeable future projects would also require the construction of onshore facilities at identified ports along the Atlantic coast. Installation of onshore elements of reasonably foreseeable future projects could also result in the discharge of drilling fluids, solid wastes, construction debris, lubricants, oils, fuels, and other hazardous materials during construction, installation, and decommissioning. In context of reasonably foreseeable future actions, the combined offshore accidental release impacts on land use and coastal infrastructure could increase the risk of and potential impacts from accidental releases in the GAA. Other reasonably foreseeable actions would also be required to implement EPMs and adhere to federal, state, and local regulations to ensure that accidental releases and discharges are minimized and mitigated appropriately. Therefore, cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable future activities would be **negligible** adverse on land use and coastal infrastructure.

New cable emplacement/maintenance: The Proposed Action would result in increased onshore land disturbance during the construction and installation phase of the Project. It would result in temporary increases in construction noise, vibration and dust, and intermittent delays in travel along impacted roads. O&M activities would include periodic inspections and repairs at cable access manholes, which would require minimal use of worker vehicles and construction equipment. Reasonably foreseeable projects are expected to also result in land disturbances consistent with the Proposed Action in terms of scale, intensity, and duration at the ports and other facilities across the Atlantic coast where these projects are expected to occur. Assuming that new substations for future offshore wind projects would be in locations designated for industrial or utility uses, and underground cable conduits would primarily be co-located with roads or other utilities, operation of substations and cable conduits would not affect the established and planned land uses for a local area. Additionally, the Project and other reasonably foreseeable future projects would be required to comply with local land use and zoning regulations, which would reduce impacts to land use and coastal infrastructure. Therefore, cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on land use and coastal infrastructure.

<u>Light:</u> There would be temporary and permanent light impacts under the Proposed Action. Temporary lighting impacts would occur with Project construction, installation, and decommissioning. While most onshore construction and installation would be completed during daytime hours, some tasks could extend beyond daylight work hours and would require the use of portable floodlights that would face downward. There would also be long-term permanent light impacts associated with O&M. Operational lighting would be limited to the OnSS and ICF. All operational lighting would be required to comply with Quonset Development Corporation lighting regulations. Other reasonably foreseeable projects would also generate onshore lighting impacts similar in nature to the Proposed Action. While many of these lighting impacts would be short term and temporary during Project construction and installation, some lighting associated with onshore facilities would be permanent, resulting in long-term lighting impacts in the vicinity of the OnSS and ICF. Temporary and permanent onshore lighting impacts are expected during construction, installation, O&M, and decommissioning of reasonably foreseeable future projects, including any port upgrades at port facilities described in Appendix E. These impacts are expected to be similar in scale to the lighting impacts for the Proposed Action but distributed across port facilities along the Atlantic coast. Temporary and permanent lighting would require compliance with local development regulations at the port facilities and locations where reasonably foreseeable future projects would experience onshore lighting impacts. Therefore, cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on land use and coastal infrastructure.

<u>Noise:</u> There would be noise impacts associated with the construction and installation of the Proposed Action. Construction and installation would be limited to daylight hours and noise impacts would consist of noise generated from heavy equipment used for clearing, grading, excavation, foundation installation, and heavy lifting of substation components. Noise modeling conducted for operations of the OnSS (vhb 2021b) indicates that predicted noise levels would be below the minimum disturbance thresholds specified by code (Article VI, Sec. 8-87[a]) (Town of North Kingstown, Rhode Island 2021b). No permanent noise-generating equipment would be associated with the onshore transmission cable, resulting in no impacts to current land uses from operational noise. The OnSS and ICF, as designed, would generate sound similar to or below existing ambient sound levels, as described in Section 3.14.2.2.2; therefore, operational noise levels would have a direct but small impact on land use and coastal infrastructure by increasing noise levels in the vicinity of onshore elements of the Proposed Action. Additionally, O&M and maintenance vehicles could result in increased noise in the vicinity when maintenance is being performed. However, all equipment and O&M activities would be designed for and consistent with zoned land uses and appropriate ordinance restrictions, as described in Section 3.14.2.2.2. It is expected that noise impacts generated by other planned and foreseeable future actions would be generally similar to those generated under the Proposed Action, and those actions would similarly manage

impacts consistent with local ordinances applicable to zoned land uses. Therefore, cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable future activities would have a **negligible** adverse effect on land use and coastal infrastructure.

3.14.2.2.4 Conclusions

Proposed Action construction and installation and decommissioning would temporarily generate noise, vibration, and vehicular traffic. Impacts during O&M would be expected to be similar, but in lower duration and extent. Therefore, BOEM expects the overall impact on land use and coastal infrastructure from the Proposed Action alone to be **minor** adverse. Proposed Action O&M would also generate long-term, **minor** beneficial impacts by supporting designated uses at ports and potentially promoting port improvements and/or redevelopment, though no port improvements are currently proposed as part of this project.

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 impacts to land use and coastal infrastructure. BOEM made this call because, while port use during construction and installation could result in **moderate** adverse impacts, the overall effect when impacts are considered over the entire GAA and analysis duration would be small and the resource would be expected to recover completely.

3.14.2.3 Alternatives C, D, E, and F

Table 3.14-1 provides a summary of IPF findings for these alternatives.

3.14.2.3.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and possibly reduce the miles of IAC, these changes would not measurably affect land use and coastal infrastructure. Therefore, BOEM expects that the impacts to land use and coastal infrastructure resulting from the alternative would be similar to the Proposed Action and would result in **minor** adverse impacts, which is the same impact determination as the Proposed Action.

The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same level as under the Proposed Action: **minor** adverse.

3.14.2.4 Mitigation

No potential additional mitigation measures for land use and coastal infrastructure are identified in Table F 2 in Appendix F.

3.15 Marine Mammals (see section in main EIS)

3.16 Navigation and Vessel Traffic (see section in main EIS)

3.17 Other Uses (see section in main EIS for Scientific Research and Surveys)

3.17.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Other Uses

Geographic analysis area: The GAAs for Other Uses are as follows (Figure 3.17-1):

Aviation and air traffic: Airspace and airports used by regional air traffic.

Land-based radar: Includes air space used by regional traffic.

Marine mineral resources and dredged material disposal: Areas within 0.25 mile of the Project and footprints of other cables and wind lease areas in the RI/MA WEA (not analyzed in detail in this chapter; see Appendix E2).

Military and national security: An area roughly bounded by Montauk, New York; Providence, Rhode Island; Provincetown, Massachusetts; and within a 10-mile buffer from wind lease areas in the RI/MA WEA.

Offshore energy uses: Other known wind energy project locations (not analyzed in detail in this chapter; see Appendix E2).

Undersea cables: Area within 1 mile of the Project and other undersea facilities and wind lease areas in the RI/MA WEA.

These areas encompass locations where BOEM anticipates direct and indirect impacts associated with Project construction and installation, O&M, and decommissioning. The scientific research survey area encompasses the locations where scientific research and surveys are anticipated to occur.

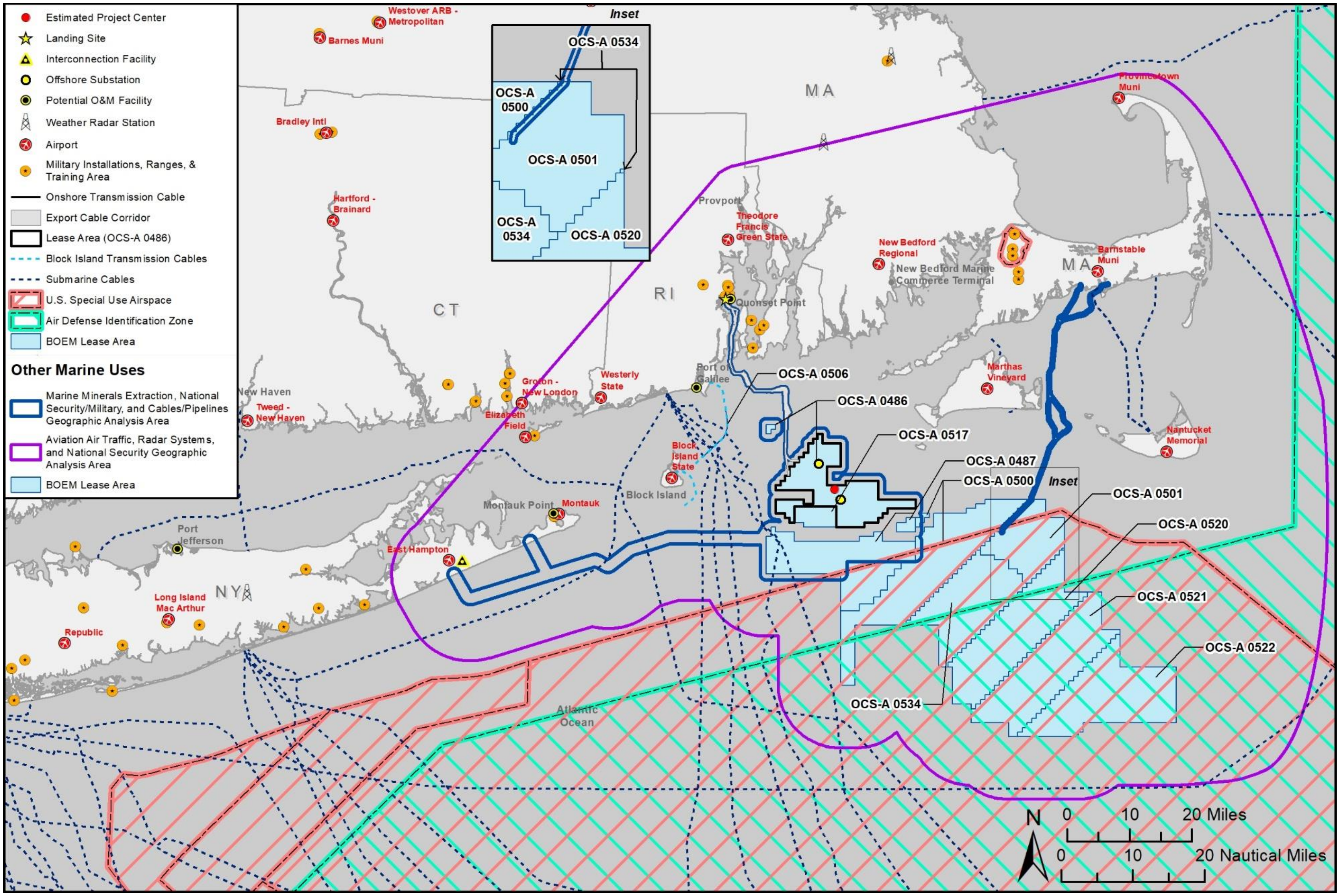

Figure 3.17-1. Geographic analysis areas for other uses.

3.17.1.1 Aviation and Air Traffic

Affected environment: Numerous public and private airports serve portions of New York, Rhode Island, and Massachusetts in the GAA. Major airports serving the region include Boston Logan International Airport, located approximately 100 miles northeast of the Project; T.F. Green Airport in Providence, Rhode Island, located approximately 50 miles north of the Project; and Montauk Airport in Montauk, New York, approximately 30 miles west of the RWF and 9 miles north of the offshore RWEC. The closest public airports to the Project are Nantucket Memorial Airport, approximately 55 miles east on Nantucket; Martha's Vineyard Airport, approximately 32 miles northeast on Martha's Vineyard; and Block Island State Airport, approximately 20 miles west on Block Island.

3.17.1.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential aviation and air traffic impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E2.

Aviation and air traffic: Future offshore wind activities without the Proposed Action could result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects. While the exact increase in future project-related flights is unknown, it is anticipated that future offshore wind activities would result in an increase in flight traffic for construction, ongoing wildlife surveys, and (search and rescue) SAR related to offshore wind project vessel traffic. Based on FAA (2022) data, the Proposed Action would conservatively add up to 7% to FAA-reported air traffic in the GAA for all aircraft types per year during the construction and decommissioning phases and 0.1% during O&M. It can be assumed, therefore, that other wind activities could result in similar air traffic increases, with future projects potentially overlapping in construction and/or decommissioning phases. These simplified assumptions are conservative, likely overestimate future air traffic, and do not account for aircraft concentration near New England region airports. Future offshore wind project air traffic would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. With implementation of FAA-approved flight plans, impacts of the No Action Alternative on aviation and air traffic would be **negligible** adverse.

Light: Future offshore wind activities without the Proposed Action would result in an increase in permanent aviation warning lighting on WTGs offshore. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize collision risks and optimize aviation safety. The addition of up to 1,036 lighted structures represents a substantive increase in the number and extent of aviation and navigation safety lighting systems operating within the GAA, an area that includes lighting from military, commercial, and construction vessels; vessel-related lighting such as buoys and towers; and onshore lighting from housing and ports. Therefore, the effects of light on aviation and air traffic under the No Action Alternative would be **minor** adverse.

Port utilization: There may be a minimal increase in vessel use at ports associated with the No Action Alternative. The number of construction vessels would increase due to future offshore wind activities without the Proposed Action, which could result in delays and congestion at ports and lead to potential conflicts with air traffic due to increased activity in the vicinity of the airports listed in Section 3.17.1.1. Port improvements and construction activities in or near ports may require alteration of navigation patterns at nearby airports. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed, and all navigation hazards and collision risks would be gradually eliminated during decommissioning as offshore WTGs are removed. In addition, vessel traffic would be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on aviation and air traffic.

Presence of structures: Future offshore wind development could add up to 1,036 structures to the offshore environment in the analysis area. WTGs could have maximum blade tip height of 1,171 feet (357 m) amsl. Addition of these structures would noticeably increase navigational complexity and change aircraft navigation patterns in the region around the leased areas offshore Massachusetts and Rhode Island, along transit routes between ports and construction sites, and locally around ports (see Port Utilization). These changes could compress lower-altitude aviation activity into more limited airspace in these areas, leading to airspace conflicts or congestion, and increasing collision risks for low-flying aircraft. However, open airspace around the RI and MA Lease Areas would still be available over the open ocean, and ports used for offshore WTG construction would be planned and developed to accommodate tall structures.

Open airspace around the Lease Areas would still exist after all foreseeable future offshore wind energy projects are built. BOEM assumes that offshore wind project operators would coordinate with aviation interests throughout the planning, construction and installation, O&M, and decommissioning process to avoid or minimize impacts on aviation activities and air traffic. For this reason, the effects of increased presence of structures to aviation and air traffic under the No Action Alternative are anticipated to be **minor** adverse.

Vessel traffic: Although no future non–offshore wind stationary structures were identified within the Lease Area, vessel traffic associated with future offshore wind projects located outside the Lease Area would result in increased vessel traffic in the RI/MA WEA and surrounding ports. The impacts of increased vessel traffic are discussed above under Port Utilization and Presence of Structures. Vessel traffic is expected to have a **negligible** adverse effect on aviation and air traffic because vessel traffic would be spread throughout a large geographic area, and while construction time frames may overlap, it is anticipated that the increase in vessel traffic would not impact aviation and air traffic.

3.17.1.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on other uses associated with the Project would not occur. However, ongoing and future activities would have **minor** adverse impacts on aviation uses due to the presence of structures that introduce navigational complexities.

BOEM anticipates that impacts to aviation uses from the combination of most ongoing activities and reasonably foreseeable activities other than offshore wind would be **negligible** adverse because any issues with aviation routes would be resolved through coordination with the FAA, as well as through implementation of navigational marking of structures according to FAA, USCG, and BOEM requirements and guidelines.

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 **minor** adverse impacts for aviation uses.

3.17.1.2 Land-Based Radar

Affected environment: Several radar systems supporting commercial air traffic control, national defense, weather forecasting, and ocean condition observation operate near the Project (Westslope Consulting, LLC [Westslope] 2021). Six high-frequency airport surveillance (ASR) radar sites are located near the Project: Boston ASR-9, Falmouth ASR-8, Nantucket ASR-9, North Truro ARSR-4, Providence ASR-9, and Riverhead ARSR-4. The study area is beyond the instrumented range of the Boston ASR-9.

Three navigational aid sites are near the Project: Martha's Vineyard VOR/DME, the Providence VOR/DME, and Sandy Point VOR/DME. Two NEXRAD weather radar systems, the Boston WSR-88D and Brookhaven WSR-88D, are located near the Project.

There are 13 high-frequency radar sites located near the Project:

- Amagansett HF radar (operated by Rutgers University)
- Block Island Long Range HF radar (two radars operated by the University of Rhode Island and Rutgers University)
- Camp Varnum HF radar (operated by Woods Hole Oceanographic Institution)
- Horseneck Beach State Reservation HF radar (operated by Woods Hole Oceanographic Institution)
- Long Point Wildlife Refuge HF radar (operated by Woods Hole Oceanographic Institution)
- Martha's Vineyard HF radar
- Moriches HF radar (operated by Woods Hole Oceanographic Institution)
- Martha's Vineyard Coastal Observatory (MVCO) Meteorological Mast HF radar (operated by Woods Hole Oceanographic Institution)
- Nantucket Island HF radar (two radars operated by Rutgers University and Woods Hole Oceanographic Institution).
- Nauset HF radar (operated by the University of Massachusetts Dartmouth)
- Squibnocket Farms HF radar (operated by Woods Hole Oceanographic Institution)

3.17.1.2.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential radar impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E2.

Presence of structures: WTGs that are near or in direct line-of-sight to land-based radar systems can interfere with the radar signal causing shadows or clutter in the received signal. WTGs can also affect HF radar measurements of coastal ocean currents, oil spill tracking, and vessel drift tracking (BOEM 2020). Modeling completed on behalf of BOEM (2020) shows that small aircraft detection interference would occur in the vicinity of each WTG. Construction of 1,036 structures in the RI/MA WEA could lead to long-term, **minor** adverse cumulative impacts to radar systems. While these structures would be sited at such a distance from existing and proposed land-based radar systems to minimize interference to most radar systems, event-based operational changes and modification of some land-based radar may be necessary. Event-based operational change may include wind farm curtailment agreements for BOEM lease areas that would cease wind farm operations when HF radar efficiency is essential, such as in the event of a severe hurricane/tropical storm or a large oil spill. BOEM (2020) is also currently developing a software upgrade for land-based HF radar to minimize impacts from offshore wind energy facilities. For vessel-based radar, the final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) concludes that general mitigation measures, such as properly trained vessel-based radar operators, properly installed and adjusted vessel equipment, marked wind turbines, and the use of AIS would enable safe navigation in the GAA with minimal loss of radar detection.

<u>Vessel traffic:</u> Although no future non–offshore wind stationary structures were identified within the Lease Area, construction and operational vessel traffic from future offshore wind development outside the Lease Area is expected to increase. This could impact land-based radar by increasing the number of vessels in the analysis area. BOEM assumes that all offshore wind developments in the GAA would use the developer agreed upon 1 × 1–nm spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This would allow more space for vessels to navigate and would help reduce potential interference on radar systems. As a result, the effects of vessel traffic on land-based radar under the No Action Alternative would be **minor** adverse.

3.17.1.2.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on other uses associated with the Project would not occur. However, ongoing and future activities would have **minor** adverse impacts on other uses due to the presence of structures that increase radar interference.

BOEM anticipates that impacts to radar would be **negligible** adverse for any individual ongoing and reasonably foreseeable activity other than offshore wind because any issues with radar systems would be resolved through coordination with the Department of Defense (DOD) or FAA.

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 notable and **moderate** adverse impacts to radar systems due to combined WTG interference.

3.17.1.3 Military and National Security

<u>Affected environment:</u> The U.S. Navy, the USCG, and other military entities have numerous facilities in the region. Major onshore regional facilities include Naval Station Newport, the Naval Submarine Base New London, the Northeast Range Complex/Narragansett Bay Operation Area, Joint Base Cape Cod, and numerous USCG stations (Epsilon Associates, Inc. 2018). Onshore and offshore military use areas could have designated surface and subsurface boundaries and special use airspace. The Project is entirely within the Navy’s Narragansett Operating Area in which national defense training exercises and system qualification tests are routinely conducted (MARCO 2021). This operating area extends approximately

100 miles south and 200 miles east of the Project. The Project is approximately 10 miles north of a Military Special Use Airspace (FK Facility Narragansett Bay) and 20 miles northeast of the closest submarine transit lanes. A DOD assessment of compatibility of offshore wind development with military assets and activities determined that potential conflicts exist in the area surrounding the Project and could require site-specific mitigation measures (OCM 2019).

3.17.1.3.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential military and national security impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

<u>Anchoring and new cable emplacement/maintenance:</u> Up to 12,196 acres could be affected by anchoring and mooring activities and cable installation during offshore wind energy development within the analysis area. This offshore energy facility construction of new cable emplacement and maintenance of cables would involve increased vessel traffic which could impact military and national security uses by increasing the number of vessels within the analysis area. Increased vessel traffic due to anchoring and cable maintenance of wind facilities could lead to course changes of military vessels, thereby increasing navigational complexity and risk of collisions. However, these impacts are expected to be low because military vessels would largely travel in transit lanes, with the exception of SAR operations, and short term due to the limited amount of cable emplacement and maintenance expected from future offshore wind activities. Therefore, the effects of anchoring and new cable emplacement and maintenance under the No Action Alternative on military and national security would be **negligible** adverse**.**

<u>Aviation and air traffic:</u> Future offshore wind activities could result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects that in turn may increase the necessity for data collection and SAR operations. While the exact increase in future project-related flights is unknown, it is anticipated that future offshore wind-related flight traffic would be low and would be unlikely to affect military use of the area in SAR and data collection activities. Future offshore wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. With implementation of FAA-approved flight plans, impacts of the No Action Alternative on military and national security would be **negligible** adverse**.**

<u>Light:</u> Future offshore wind activities would result in an increase in permanent aviation warning lighting on WTGs offshore. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize allision risks. Implementation of navigational lighting and marking per FAA and BOEM requirements and guidelines would further reduce the risk of military aircraft collisions. This increase in lighting would add to vessel and navigational lighting, as well as onshore housing and port lighting, in the GAA, which could have a negative impact on military and national. Therefore, the effects of light on military and national security under the No Action Alternative would be **minor** adverse.

<u>Presence of structures:</u> Installation of up to 1,036 structures in the RI/MA WEA, which currently supports only five offshore wind turbines associated with the BIWF, as well as several meteorological buoys (see Appendix E1), would impact military and national security vessels primarily through risk of allision and collision with stationary structures and other vessels. Vessels could directly allide with WTG foundations.

Vessel traffic would increase during project construction, and once the WTGs are operational, the artificial reef effect created by offshore structures could attract commercial and recreational fishing vessels. This would increase the risk of vessel collisions and increase navigation complexity, leading to potential use conflicts. In general, risks to military and national security vessels would increase over time as additional wind energy facilities are built.

Military and national security vessels could allide with WTG structures. However, deep-draft military vessels are not anticipated to transit outside of navigation channels unless necessary for SAR (of people or marine mammals) or nontypical operations. Allision risks for smaller vessels moving within or near offshore wind structures would be higher. However, these risks would be minimized by projects adhering to structural lighting requirements according to the USCG and BOEM, which would provide lighting at sea level. Additionally, allision would be further mitigated by following a fixed 1 × 1–nm WTG layout proposed by offshore wind leaseholders to facilitate safe navigation through the offshore wind energy Lease Areas (Geijerstam et al. 2019).

Additionally, risk of collision with recreational fishing vessels could indirectly increase as a result of the artificial reef effect around the offshore wind facility structures. New artificial reef effects could attract recreational fishing vessels farther offshore than currently occurs, adding to existing vessel traffic and subsequently increasing the risk of collision with military and national security vessels. Furthermore, an increase in recreational vessels in and around offshore wind projects could increase the demand for USCG SAR operations (of people or marine mammals).

In addition to allision or collision risks, military and national security vessels may be impacted by offshore wind energy structures by the need to change routes and navigate around both project footprints and project-associated vessels, particularly during the construction periods between 2021 and 2030. Furthermore, military and national security vessels may experience congestion and delays in port due to the increase in offshore wind facility vessels.

Military and national security aircraft would be impacted by the presence of tall equipment necessary for offshore wind facility construction, such as stationary lift vessels and cranes, which would increase navigational complexity in the area. Warning area W-105A measures approximately 23,000 square miles, with approximately 4% (approximately 1,000 square miles) overlaying the GAA (BOEM 2021). Military and national security operations conducted within W-105A would be impacted during construction and operation periods. However, it is assumed all offshore wind energy project operators would coordinate with relevant agencies during the COP development process to identify and minimize conflicts with military and national security operations.

Measures mitigating risks would include operational protocol to stop WTG rotation during SAR aircraft operations and implementation of FAA- and BOEM-recommended navigational lighting and marking to reduce the risk of aircraft collisions. Wind energy structures would be visible on military and national security vessel and aircraft radar. Nonetheless, the presence and layout of large numbers of WTGs could make it more difficult for SAR aircraft to perform operations (of people or marine mammals), leading to less effective search patterns or earlier abandonment of searches. This could result in otherwise avoidable loss of life due to maritime incidents.

Navigational hazards would gradually be eliminated as structures are removed. Based on coordinating efforts and the anticipated mitigating measures discussed above, the overall impacts to military and national security uses are anticipated to be **moderate** adverse under the No Action Alternative.

Vessel traffic: Although no future non–offshore wind stationary structures were identified within the Lease Area, increased vessel traffic due to construction and decommissioning of future offshore wind facilities outside the Lease Area could lead to course changes of military and national security vessels, congestion and delays at ports, and increased traffic along vessel transit routes. Vessel activity could peak in 2025 with as many as 276 vessels involved in construction of reasonably foreseeable projects. While construction periods of various wind energy facilities may be staggered, some overlap would result in a cumulative impact to traffic loads. Therefore, the effects of vessel traffic on military and national security under the No Action Alternative would be **minor** adverse.

3.17.1.3.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on other uses associated with the Project would not occur. However, ongoing and future activities would have **moderate** adverse impacts on military and national security uses due to the presence of structures that introduce navigational complexities and vessel traffic.

BOEM anticipates that impacts to military and national security uses from the combination of most ongoing activities and reasonably foreseeable activities other than offshore wind would be **negligible** adverse because BOEM anticipates that any issues with the military or national security would be resolved through coordination with the DOD, as well as through implementation of navigational marking of structures according to FAA, USCG, and BOEM requirements and guidelines.

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 for military and national security uses.

3.17.1.4 NOAA's Scientific Research and Surveys (see section in main EIS)

3.17.1.5 Undersea Cables

Affected environment: There are existing submarine cables that run through the regional waters. Most pass through Green Hill, Rhode Island. In addition, there are NOAA nautical chart cable and pipeline areas that denote where such infrastructure may be located. The existence of these areas does not necessarily mean that actual cables or pipeline are present (BOEM 2013). Other than cables for other offshore wind projects, BOEM has not identified any publicly noticed plans for additional submarine cables or pipelines; therefore, no new cable installation is reasonably foreseeable for the purposes of this EIS.

3.17.1.5.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential undersea cable impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E2.

Presence of structures: Up to 1,036 structures could be installed between 2021 and 2030 in the RI/MA WEA as part of future offshore wind energy project infrastructure. The presence of future offshore wind energy structures could preclude future submarine cable placement, as discussed in Appendix E2 in "Anchoring and new cable emplacement/maintenance." Installed WTGs and OSSs and stationary lift vessels used during construction that are located near existing submarine cables could pose allision risks and navigational hazards to vessels conducting maintenance activities on these cables. The future development of multiple wind energy projects could increase the complexity of undersea cable development by requiring routing around the facilities. Export cables are unlikely to preclude future undersea cable development because cable crossings can be protected using standard design techniques. Therefore, in context of reasonably foreseeable environmental trends, the overall impacts from the presence of structures resulting from ongoing and planned actions are anticipated to be localized long term **negligible** adverse because impacts can be avoided by routing design and standard cable protection techniques.

Vessel traffic: Although no future non–offshore wind stationary structures were identified within the Lease Area, increased vessel traffic due to construction and installation of future offshore wind activities located outside the Lease Area could interfere with vessels used to install or maintain existing and future undersea cables. Increased vessel traffic due to Project construction and installation, O&M, and decommissioning could lead to course changes of vessels used for undersea cable maintenance and installation and increased traffic along vessel transit routes. The risk of allision to cable maintenance vessels could increase as more offshore wind energy projects are constructed. However, given the infrequency of required maintenance at any given location along a cable route, this risk is expected to be low. Therefore, the effects of vessel traffic on undersea cables under the No Action Alternative would be **negligible** adverse**.**

3.17.1.5.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on other uses associated with the Project would not occur. Ongoing and future activities would have **negligible** adverse impacts on undersea cables due to the presence of offshore wind energy cables or structures that could preclude future submarine cable placement and vessel traffic.

BOEM anticipates that impacts to undersea cables from the combination of most ongoing activities and reasonably foreseeable activities other than offshore wind would be **negligible** adverse because BOEM anticipates that cables could be easily crossed by vessels and existing cables require minimal maintenance.

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 **negligible** adverse impacts on undersea cables.

3.17.2 Environmental Consequences

3.17.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

The analysis presented in this section considers the impacts resulting from the maximum design scenario under the project design envelope (PDE) approach developed by BOEM to support offshore wind project development (Rowe et al. 2017). The maximum design size specifications defined in Appendix D, Table D-1, are PDE parameters used to conduct this analysis.

The following design parameters would result in different impacts relative to those generated by the design elements considered under the PDE:

- The selection of lower capacity WTG designs would reduce the total WTG height from 873 to as low as 648 feet, reducing impacts to aviation and air traffic, land-based radar, and military and national security.

See Appendix E1 for a summary of IPFs analyzed for other uses across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Appendix E1, Tables E2-15 to E2-21. Other uses subsections (NOAA's scientific research and surveys) are discussed in the main EIS.

Table 3.17-1 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion. This comparison considers the implementation of all EPMs proposed by Revolution Wind to avoid and minimize adverse impacts on other uses. These EPMs are summarized in Appendix F, Table F-1.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

The Conclusion section within each alternative analysis discussion includes rationale for the effects determinations. The overall effect determination for each alternative is **minor** adverse impacts for aviation and air traffic; **moderate** adverse for land-based radar; **moderate** adverse for military uses; and **negligible** adverse for undersea cables.

Table 3.17-1. Alternative Comparison Summary for Other Uses

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Aviation and Air Traffic						
Aviation and air traffic	**Offshore:** Future offshore wind activities without the Proposed Action could result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects. With implementation of FAA-approved flight plans, however, impacts of the No Action Alternative on aviation and air traffic would be **negligible** adverse.	**Offshore:** The Proposed Action would result in an increase in air traffic related to construction and installation of offshore Project elements. A helicopter route plan would be developed to meet industry guidelines and best practices in accordance with FAA guidance. Additionally, all aviation operations, including flying routes and altitude, would be aligned with relevant stakeholders, such as the FAA. On this basis, the effects of Project-related aviation and air traffic on aviation and air traffic under the Proposed Action would be **minor** adverse. Helicopter flights for Project O&M would represent a 0.1% increase in annual helicopter flight hours and a 0.01% increase in general aviation hours in the GAA. When estimation uncertainty is considered, this represents a **negligible** adverse effect on general aviation air traffic. The Proposed Action and reasonably foreseeable future wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in **negligible** adverse impacts on aviation and air traffic.	**Offshore:** This alternative could require fewer construction and O&M–related helicopter trips due to the reduction in the number of offshore elements, incrementally reducing the number of construction-related helicopter trips. While Alternatives C to F could result in slightly reduced air traffic, the effects of this IPF on aviation and air traffic under each alternative would otherwise be similar to those described for the Proposed Action: **minor** adverse for construction and **negligible** adverse for O&M and cumulative impacts.			
Light	**Offshore:** Future offshore wind activities without the Proposed Action would result in an increase in permanent aviation warning lighting on WTGs offshore. The addition of up to 1,036 lighted structures represents a small increase in the combined vessel, navigation, housing, and port lights within the GAA; therefore, the effects of light on aviation and air traffic under the No Action Alternative would be **minor** adverse.	**Offshore:** During construction and installation and O&M, WTGs would be marked with appropriate lighting to meet FAA warning guidelines and would be visible on the radar systems of low-flying aircraft, similar to other large-scale sea surface activity. Therefore, impacts to aviation and air traffic would be **negligible** adverse. BOEM estimates a maximum cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the RI/MA WEA. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidelines to minimize collision and allision risks. WTGs would also be visible on aircraft radar. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would have a **negligible** adverse impact on aviation and air traffic.	**Offshore:** Under Alternatives C through F, fewer lighted WTG locations would be approved by BOEM when compared to the maximum-case scenario under the Proposed Action. However, this slight reduction in lighting would not be expected to measurably reduce aviation and air traffic impacts compared to those impacts described under the Proposed Action. Therefore, the impact on aviation and air traffic under each alternative would be **negligible** adverse for all Project phases.			
	Onshore: See offshore analysis.	**Onshore:** Operational lighting onshore would be limited to the OnSS and ICF, which would have minimal yard lighting and task lighting. This lighting is minimal and would not result in impacts to aviation and air traffic. Decommissioning would have impacts similar to those during Project construction. Therefore, the effects of light on aviation and air traffic under the Proposed Action would be **negligible** adverse.	**Onshore:** Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to aviation and air traffic from Project activities would be **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Port utilization	**Offshore:** Port improvements and construction activities in or near ports may also require alteration of navigation patterns at nearby airports. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on aviation and air traffic.	**Offshore:** Port improvements and construction activities in or near ports may require alteration of navigation patterns at nearby airports. However, vessel traffic would also be spread among multiple ports to ensure that sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on aviation and air traffic.	**Offshore:** Alternatives C through F would require a shorter construction duration, a smaller construction footprint, and fewer offshore structures. While Alternatives C through F could result in a slight reduction in port utilization, the effects of this IPF on aviation and air traffic under Alternatives C through F would otherwise be similar to those described for the Proposed Action and would therefore be **negligible** adverse for all Project phases**.**			
	Onshore: See offshore analysis.	**Onshore:** Ports would be primarily used during construction and installation of the Proposed Action, as ports would be used for staging WTGs and mobilizing construction work. Decommissioning would have impacts similar to those during Project construction. There would be no impacts to aviation and air traffic from O&M and decommissioning of the Proposed Action; therefore, impacts would be **negligible** adverse. Cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on aviation and air traffic.	**Onshore:** Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to aviation and air traffic from Project activities would be **negligible** to **minor** adverse.			
Presence of structures	**Offshore:** Future offshore wind development could add up to 1,036 structures to the offshore environment in the GAA. BOEM assumes that offshore wind project operators would coordinate with aviation interests throughout the planning, construction and installation, O&M, and decommissioning process to avoid or minimize impacts on aviation activities and air traffic. For this reason, the effects of the increased presence of structures to aviation and air traffic under the No Action Alternative are anticipated to be **minor** adverse.	**Offshore:** The Proposed Action would add up to 100 WTGs with maximum blade tip heights of up to 853 feet amsl. The addition of these structures would increase navigational complexity and could change aircraft navigation patterns for aircraft flying at low altitudes and for airports in the vicinity, increasing collision risks for some aircraft during the Proposed Action's operational time frame. However, more than 90% of existing air traffic in the GAA would occur at altitudes that would not be impacted by the presence of WTGs (BOEM 2021). Therefore, the effects of the presence of structures on aviation and air traffic under the Proposed Action would be **negligible** adverse. BOEM estimates a cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the RI/MA WEA. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable Project impacts would result in a **minor** adverse impact on aviation and air traffic.	**Offshore:** Under Alternatives C through F, fewer WTG locations would be approved by BOEM, which would result in a noticeably smaller offshore impact compared to the maximum case under the Proposed Action. The effects of this IPF would be the same or slightly reduced to those described for the Proposed Action and would therefore be **negligible** adverse for construction and O&M, and **minor** adverse for cumulative impacts.			
	Onshore: See offshore analysis.	**Onshore:** The O&M of onshore structures to support the Proposed Action would not impact aviation and air traffic. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.	**Onshore:** Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to aviation and air traffic from Project activities would be **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Vessel traffic	**Offshore:** Vessel traffic is expected to have a **negligible** adverse effect on aviation and air traffic because vessel traffic would be spread throughout a large geographic area, and while construction time frames may overlap, it is anticipated that the slight increase in vessel traffic would not impact aviation and air traffic.	**Offshore:** Vessel traffic associated with the Proposed Action would result in increased vessel traffic in the Lease Area and around ports. Construction of offshore structures would incrementally noticeably increase navigational complexity along transit routes between ports and construction sites, and locally around ports, due to increased vessel traffic. Increased vessel traffic is expected to have a **negligible** adverse effect on aviation and air traffic because vessel traffic would be spread throughout a large geographic area and would occur over a short period of time. Vessel traffic associated with the Proposed Action and reasonably foreseeable future actions would result in increased vessel traffic in the GAA. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in a **minor** adverse impact on aviation and air traffic.	**Offshore:** Under Alternatives C through F, fewer WTG locations would be approved by BOEM. Construction and installation vessel traffic may result in slightly reduced vessel traffic in the Lease Area and around ports given the smaller offshore footprint. Reduced navigational complexity combined with a smaller construction footprint and fewer offshore structures would result in the effects of this IPF being the same or slightly reduced relative to those described for the Proposed Action. Therefore, impacts would be **negligible** adverse for construction and O&M and **minor** adverse for cumulative impacts.			
	Onshore: See offshore analysis.	**Onshore:** Onshore vehicle traffic may increase as a result of O&M and decommissioning of the Proposed Action but would not impact aviation and air traffic because aviation and air traffic uses are generally spatially separate from vehicular traffic and occur in different locations. Therefore, this IPF would result in a **negligible** adverse impact because minimal increases in vehicle traffic would not impact aviation and air traffic.	**Onshore:** Alternatives C through F would consist of the same onshore facilities and activities as those planned under the Proposed Action. Therefore, onshore impacts to aviation and air traffic from Project activities would be **negligible** adverse.			
Military and National Security (including search and rescue)						
Anchoring and new cable emplacement/ maintenance	**Offshore:** Offshore energy facility construction of new cable emplacement and maintenance of cables would involve increased vessel traffic, which could impact military and national security uses by increasing the number of vessels within the GAA. Increased vessel traffic due to anchoring and cable maintenance of wind facilities could lead to course changes of military vessels, thereby increasing navigational complexity and risk of collisions. However, these impacts are expected to be limited as cable emplacement vessels would be restricted to emplacement corridors and activities would be of short duration for future offshore wind activities. Therefore, the effects of anchoring and new cable emplacement and maintenance under the No Action Alternative on military and national security would be **negligible** adverse.	**Offshore:** Anchoring and mooring activities would involve increased vessel traffic, which could impact military and national security uses by increasing the number of vessels within the GAA. However, the impacts are expected to be limited as cable emplacement vessels would be restricted to emplacement corridors and activities would be of short duration during construction and installation of offshore Project elements. Therefore, the effects of anchoring and new cable emplacement and maintenance under the Proposed Action on military and national security would be **negligible** adverse. Project activities combined with reasonably foreseeable activities would result in a substantive increase in vessel traffic during cable emplacement and maintenance, contributing to a **minor** adverse impact on military and national security.	**Offshore:** Because the impact would be slightly reduced regardless of the configuration selected, all offshore impacts under Alternatives C through F would be slightly reduced compared to the Proposed Action. The effects of this IPF would therefore be **negligible** to **minor** adverse.			
Aviation and air traffic	**Offshore:** Future offshore wind activities could result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects. With implementation of FAA-approved flight plans, however,	**Offshore:** Construction and installation of the Proposed Action would result in a 7% increase in general aviation in the GAA. Therefore, the effects of this IPF on military and national security under the Proposed Action would be **minor** adverse.	**Offshore:** Alternatives C through F would require fewer construction-related helicopter trips due to the reduction in the number of offshore elements. However, the effects of this IPF on military and national security would otherwise be similar to those described for the Proposed Action: **negligible** adverse for O&M and **minor** adverse for construction and cumulative impacts.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
	impacts of the No Action Alternative on military and national security would be **negligible** adverse.	O&M of the Proposed Action would result in a 0.01% increase in general aviation in the GAA. Therefore, the effects of this IPF on military and national security would be **negligible** adverse. The Proposed Action and reasonably foreseeable future wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in **minor** adverse impacts on military and national security.				
Light	**Offshore:** Future offshore wind activities would result in an increase in permanent aviation warning lighting on WTGs offshore, which would add to vessel and navigational lighting, as well as onshore housing and port lighting, in the GAA, which could have a negative impact on military and national security. Therefore, the effects of light on military and national security under the No Action Alternative would be **minor** adverse.	**Offshore:** The Proposed Action would result in an increase in temporary construction aviation warning lighting on WTGs offshore, which could have **minor** adverse impacts. The O&M and decommissioning of the Proposed Action would result in an increase in permanent lighting on WTGs offshore until decommissioning is complete. The addition of permanent lighting would be an ongoing impact; therefore, the effects of light on military and national security under the Proposed Action would be **minor** adverse. The Project, with reasonably foreseeable future actions, could result in the addition of up to 1,138 lighted structures in the GAA. Therefore, the cumulative impacts of light on military and national security would be **minor** adverse.	**Offshore:** Under this alternative, fewer lighted WTG locations would be approved by BOEM. While Alternatives C through F could result in a reduction in construction lighting, the effects of this IPF on military and national security uses would otherwise be similar to those described for the Proposed Action. Therefore, the impact on military and national security uses would be **minor** adverse.			
Presence of structures	**Offshore:** Installation of up to 1,036 structures in the RI/MA WEA would impact military and national security vessels primarily through risk of allision and collision with stationary structures and other vessels. Based on coordinating efforts and anticipated mitigating measures, however, the overall impacts to military and national security uses are anticipated to be **moderate** adverse.	**Offshore:** Construction of the Proposed Action would increase the risk of collisions and allisions for military and national security vessels or aircraft within the WEA. Structures would be marked as a navigational hazard per FAA, BOEM, and USCG requirements, and risk would be consistent within the 35-year operational period. The Project's 1 × 1–nm spacing reduces some of the risk of collisions and allisions. Therefore, the Project would have **minor** to **moderate** adverse impacts on military operations and national security. The presence of additional recreational vessels would add to conflict or collision risks for military and national security vessels and could increase demand for SAR operations. Therefore, the Project would have **minor** adverse O&M impacts on military operations and national security. The Proposed Action structures represent a 10% increase over total estimated WTG and OSS foundations across the GAA under the No Action Alternative. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would consist predominately of impacts described under the No Action Alternative, which would be **moderate** adverse.	**Offshore:** While the offshore footprint would be reduced under all configurations, the effects of this IPF on military and national security uses under Alternatives C through F would otherwise be similar to those described for the Proposed Action. Therefore, the impact of this IPF on military and national security uses would be **minor** to **moderate** adverse.			
Vessel traffic	**Offshore:** Increased vessel traffic due to construction and decommissioning of future offshore wind facilities could lead to course changes of military and national security vessels, congestion and delays at ports, and increased traffic along vessel transit routes. Therefore, the effects of vessel traffic on	**Offshore:** Increased vessel traffic could impact military and national security uses by increasing the number of vessels in the GAA. The RWF's proposed 1 × 1–nm spacing would result in more space for vessels to navigate and would help reduce conflicts with military vessels. As a result,	**Offshore:** Vessel traffic associated with Alternatives C through F may result in slightly reduced vessel traffic in the Lease Area and around ports given the smaller offshore footprint. While the offshore footprint would be reduced under all configurations, vessel traffic is expected to remain at similar levels as vessel traffic under the Project. Reduced navigational complexity combined with a smaller construction footprint and fewer offshore structures would result in the effects of			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
	military and national security under the No Action Alternative would be **minor** adverse.	the effects of vessel traffic on military and national security uses under the Proposed Action would be **minor** adverse. The Proposed Action represents approximately 2% of typical vessel traffic in the GAA. Therefore, the Proposed Action would result in a **minor** adverse impact for vessel traffic on military and national security.	this IPF being the same or slightly reduced relative to those described for the Proposed Action. Therefore, impacts on military and national security would be **minor** adverse.			
Land-Based Radar						
Presence of structures	**Offshore:** Construction of 1,036 structures in the RI/MA WEA could lead to long-term, **minor** adverse impacts to radar systems. However, these structures would be sited at such a distance from existing and proposed land-based radar systems to minimize interference to most radar systems. The Final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) concludes that general mitigation measures, such as properly trained radar operators, properly installed and adjusted vessel equipment, marked wind turbines, and the use of AIS all enable safe navigation with minimal loss of radar detection.	**Offshore:** Construction and installation and O&M of offshore Project components could result in impacts to land-based radar by introducing potential obstacles to radar coverage in the RI/MA WEA. The final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) concludes that general mitigation measures, such as properly trained radar operators, properly installed and adjusted vessel equipment, marked wind turbines, and the use of AIS all enable safe navigation with minimal loss of radar detection. Therefore, the offshore Project components would result in **negligible** adverse impacts to land-based radar. The Proposed Action and past, present, and reasonably foreseeable activities would result in **minor** adverse impacts to land-based radar.	**Offshore:** Under Alternatives C through F, fewer WTG locations would be approved by BOEM. Because the impact would be slightly reduced regardless of configuration selected, all offshore impacts would be slightly reduced compared to the Proposed Action and would therefore be **negligible** to **minor** adverse. Radar line of sight backscatter effects may be altered or slightly reduced depending on which alternative configuration is selected, as all alternative configurations would reduce the number of WTGs. This could result in slightly reduced impacts to land-based radar at Falmouth ASR-8, Nantucket ASR-9, and the Providence ASR-9.			
Vessel traffic	**Offshore:** Construction and operational vessel traffic from future offshore wind development is expected to increase. This could impact land-based radar by increasing the number of vessels in the analysis area. BOEM assumes that all offshore wind developments in the GAA would use the developer agreed upon 1 × 1–nm spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This would allow more space for vessels to navigate and would help reduce potential interference on radar systems. As a result, the effects of vessel traffic on land-based radar under the No Action Alternative would be **minor** adverse.	**Offshore:** There would be increased construction and operational vessel and O&M traffic from the Proposed Action. This could impact land-based radar by increasing the number of vessels in the analysis area. The RWF's proposed 1 × 1–nm spacing would provide more space for vessels to navigate and would help reduce potential interference on radar systems. As a result, the effects of vessel traffic on land-based radar under the Proposed Action would be **negligible** adverse. Reasonably foreseeable activities are expected to also generate vessel traffic that would increase the number of vessels in the RI/MA WEA. EPMs would reduce the cumulative impacts of increased vessel traffic to a **minor** adverse level.	**Offshore:** Vessel traffic associated with Alternatives C through F may result in slightly reduced vessel traffic in the Lease Area and around ports given the smaller offshore footprint under the Habitat Alternative. Reduced navigational complexity combined with a smaller construction footprint and fewer offshore structures would result in the effects of this IPF being the same or slightly reduced relative to those described for the Proposed Action. Therefore, impacts on land-based radar would be **negligible** adverse for construction and O&M and **minor** adverse for cumulative impacts.			

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Undersea Cables						
Presence of structures	**Offshore:** The future development of multiple wind energy projects could increase the complexity of undersea cable development by requiring routing around the facilities. Export cables are unlikely to preclude future undersea cable development because cable crossings can be protected using standard design techniques. Therefore, in the context of reasonably foreseeable environmental trends, the overall impacts from the presence of structures resulting from ongoing and planned actions are anticipated to be localized long term **negligible** because impacts can be avoided by routing design and standard cable protection techniques.	**Offshore:** The presence of the Project could preclude future submarine cable placement in the RWF and RWEC, although there are no future cables identified for location within this area. The impacts from foundation construction would be minor adverse while the installation of the RWECs would be **negligible** adverse. Once the foundations are constructed, impacts from foundation O&M and decommissioning would be **minor** adverse and O&M and decommissioning of RWECs would be **negligible** adverse. The overall impact from presence of structures on undersea cables would be **minor** adverse. BOEM estimates a cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the RI/MA WEA. While these structures could increase the routing complexity of undersea cables associated, cable crossing can be protected using standard cable protections. The impacts from foundation construction from reasonably foreseeable future actions would be **negligible** adverse because impacts can be avoided by routing design and standard cable protection techniques.	**Offshore:** Because the impact would be slightly reduced regardless of configuration selected, all offshore impacts under Alternatives C through F would be slightly reduced compared to the Proposed Action. The effects of this IPF would be the same or slightly reduced relative to those described for the Proposed Action and would therefore be **negligible to minor** adverse for construction and O&M and **negligible** adverse for cumulative impacts.			
Vessel traffic	**Offshore:** Increased vessel traffic due to construction and installation of future offshore wind activities could interfere with vessels used to install or maintain existing and future undersea cables, or lead to course changes of vessels used for undersea cable maintenance and installation and increased traffic along vessel transit routes. However, given the infrequency of required maintenance at any given location along a cable route, the effects of vessel traffic on undersea cables under the No Action Alternative would be **negligible** adverse.	**Offshore:** Increased vessel traffic due to construction and installation of the Proposed Action could interfere with vessels used to install or maintain existing and future undersea cables. Additionally, there would be increased risk for allisions with vessels used for construction and O&M of undersea cables. These effects are expected to be minimal and short term. Therefore, the effects of vessel traffic on undersea cables under the Proposed Action would be **negligible** adverse. The cumulative impact from vessel traffic on undersea cables would be **negligible** adverse.	**Offshore:** Vessel traffic associated with Alternatives C through F may result in slightly reduced vessel traffic in the Lease Area and around ports given the smaller offshore footprint. Reduced navigational complexity combined with a smaller construction footprint and fewer offshore structures would result in the effects of this IPF being the same or slightly reduced relative to those described for the Proposed Action. Therefore, impacts on undersea cables would be **negligible** adverse.			

3.17.2.2 Alternative B: Impacts of the Proposed Action on Aviation and Air Traffic

3.17.2.2.1 Construction and Installation

Offshore Activities and Facilities

Aviation and air traffic: The Proposed Action would result in an increase in air traffic related to construction and installation of offshore Project elements. Project construction would result in one to two helicopter flights to and from the Project area per day for construction of the foundations. Helicopters would also be used for additional crew transfers during construction activities. Estimated helicopter use for the RWF during the construction phase is estimated to be less than 200 helicopter trips and approximately 8,832 hours of flight time over the 2-year construction period (COP Appendix T [Tech Environmental 2021]). Based on national aviation statistics (FAA 2020), general aviation aircraft logged an estimated 792,266 hours of total flight in the FAA's New England Region in 2019. Extrapolating from nationwide statistics, helicopters would account for approximately 93,000 hours of the New England Region total. The Proposed Action would require a total estimated 8,832 hours of helicopter flight time for Project construction and installation, or approximately 4,416 flight hours per year, over the 2-year construction period of the Project. The GAA represents approximately 8% of the 160,000 square miles of airspace in the FAA New England Region. Applying this proportion, helicopter flights for Project construction and installation would represent a 63% increase in annual helicopter flight hours and a 7% increase in general aviation hours in the GAA. The effect determination is based on the 7% increase in general aviation hours in the GAA, as the increase in helicopter hours specifically would not have a direct impact on aviation and air traffic compared to the general overall increase in aircraft in the GAA. When estimation uncertainty is considered, the 7% increase in Project-related air traffic over the 2-year construction period represents a **minor** adverse effect on general aviation air traffic. A helicopter route plan would be developed to meet industry guidelines and best practices in accordance with FAA guidance. Additionally, all aviation operations, including flying routes and altitude, would be aligned with relevant stakeholders, such as the FAA. On this basis, the effects of Project-related aviation and air traffic on aviation and air traffic under the Proposed Action would be **minor** adverse.

Lighting: During construction and installation, WTGs would be marked with appropriate lighting to meet FAA warning guidelines and would be visible on the radar systems of low-flying aircrafts, similar to other large-scale sea surface activity. Therefore, impacts to aviation and air traffic would be **negligible** adverse.

Port utilization: Various ports would be improved to support the Proposed Action (see Section 3.14). These improvements would occur within the boundaries of existing port facilities, would be similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. The number of construction vessels would increase due to future offshore wind activities without the Proposed Action which could result in delays and congestion at ports which could lead to potential conflicts with air traffic due to increased activity in the vicinity of the airports listed in Section 3.17.1. Port improvements and construction activities in or near ports may require alteration of navigation patterns at nearby airports; however, port improvements are anticipated to occur under the No Action Alternative to support regional offshore wind energy industry development. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed. However, vessel traffic would also be spread among multiple ports to ensure that sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on aviation and air traffic.

Presence of structures: The Proposed Action would add up to 100 WTGs with maximum blade tip heights of up to 853 feet amsl. The addition of these structures would increase navigational complexity and could change aircraft navigation patterns for aircraft flying at low altitudes and for airports in the vicinity, increasing collision risks for some aircraft during the Proposed Action's operational timeframe. However, more than 90% of existing air traffic in the analysis area would occur at altitudes that would not be impacted by the presence of WTGs (BOEM 2021).

For the air traffic that occurs at altitudes that could be impacted by the presence of WTGs, the FAA conducts aeronautical studies to ensure that proposed structures do not have an effect on air navigation safety and the ability of aircraft to efficiently use navigable airspace. Proposed structures are considered as having an adverse effect if they exceed obstacle clearance surfaces.

An air traffic flow analysis for the Project was completed (Capitol Airspace Group 2020). WTGs at a height of 873 ASL could affect Visual Flight Rules (VFR) routes, requiring an increase to a Block Island State Airport (BID) instrument approach minimum altitude, Boston Consolidated (A90) Terminal Radar Approach Control (TRACON) minimum vectoring altitudes (MVAs), and Providence (PVD) TRACON MVAs.

However, historical air traffic data indicates that 873-foot ASL wind turbines would not affect any regularly used VFR routes. Additionally, historical air traffic data indicates that the required changes to the BID instrument approach procedure, A90 TRACON MVA sectors and PVD TRACON MVA sectors, should not affect a significant volume of operations. As a result of these findings, it possible that the FAA would be willing to increase the affected altitudes in order to accommodate wind development up to 873 feet ASL. These mitigation options are available and subject to FAA approval. Therefore, the effects of the presence of structures on aviation and air traffic under the Proposed Action would be **negligible** adverse.

Vessel traffic: Vessel traffic associated with the Proposed Action would result in increased vessel traffic in the Lease Area and around ports. Construction of offshore structures would noticeably increase navigational complexity along transit routes between ports and construction sites, and locally around ports due to increased vessel traffic. Increased vessel traffic is expected to have a **negligible** adverse effect on aviation and air traffic because vessel traffic would be spread throughout a large geographic area and would occur over a short period of time.

3.17.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Aviation and air traffic: The Proposed Action would result in an increase in air traffic related to O&M and decommissioning of the Proposed Action. A hoist-equipped helicopter may be used to support O&M (vhb 2022). Table 3.5-5 in the COP provides a summary of O&M support vessels that are currently being considered to support Project O&M. The type and number of vessels and helicopters would vary over the operational lifetime of the Project.

During O&M, helicopters would be used to provide supplemental means of access when vessel access is not practical or desirable. Flights would be currently restricted to daylight operations when visibility is good. Helicopters would be used for two different purposes to support O&M:

- Helicopter hoist operations: An integrated helicopter hoist platform located on the roof of each WTG nacelle would provide access for O&M. SOVs and the OSSs may also be fitted with helicopter hoist platforms. The purpose of this effort is primarily for transport and transfer of technical personnel and equipment on to/from the WTGs via hoist to the nacelle but can also be conducted for transport and transfer of personnel and equipment to offshore installations that do not have a helideck. This is the most common means of access in the O&M phase and is typically used to perform minor repairs and restarts.
- Transport and transfer operations: Transport helicopter operations are flights from an onshore airport or heliport to an offshore installation or vessel with a helideck and back. Transfer helicopter operations are flights within the WEA from an offshore installation or vessel with a helideck to another, and back.

All aviation operations, including flying routes and altitude, would be aligned with relevant stakeholders, such as the FAA. It is anticipated that there would be up to 800 helicopter trips and a total flight time of up to 252 hours of flight time for O&M of the Project (Tech Environmental 2021). Based on national aviation statistics (FAA 2020), general aviation aircraft logged an estimated 792,266 hours of total flight in the FAA's New England Region in 2019. Extrapolating from nationwide statistics, helicopters would account for approximately 93,000 hours of the New England Region total. The Proposed Action would require an estimated 252 hours of helicopter flight time for project O&M, or approximately 8.4 flight hours per year, over the 35-year operating period of the Project. The GAA represents approximately 8% of the 160,000 square miles of airspace in the FAA New England Region. Applying this proportion, helicopter flights for Project O&M would represent a 0.1% increase in annual helicopter flight hours and a 0.01% increase in general aviation hours in the GAA. When estimation uncertainty is considered, this represents a **negligible** adverse effect on general aviation air traffic. On this basis, the effects of Project-related aviation and air traffic on aviation and air traffic under the Proposed Action would be **negligible** adverse.

Light: During O&M, WTGs would be marked with appropriate lighting to meet FAA warning guidelines and would be visible on the radar systems of low-flying aircrafts, similar to other large-scale sea surface activity. Decommissioning would have impacts similar to those during Project construction. Therefore, impacts to aviation and air traffic would be **negligible** adverse**.**

Port utilization: Various ports could be improved to support the Proposed Action (see Section 3.14). These improvements would likely occur within the boundaries of existing port facilities, similar to existing activities at the existing ports, and would support state strategic plans and local land use goals for the development of waterfront infrastructure. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed, and all navigation hazards and collision risks would be gradually eliminated during decommissioning as offshore WTGs are removed. However, vessel traffic would also be spread among multiple ports to ensure that sufficient capacity exists at each port and in each waterway. Therefore, port utilization is expected to have a **negligible** adverse effect on aviation and air traffic.

Presence of structures: The Proposed Action would add up to 100 WTGs and two OSSs having maximum blade tip and structure heights of up to 853 feet and 180 feet amsl, respectively. The addition of these structures would increase navigational complexity and could change aircraft navigation patterns for aircraft flying at low altitudes and for airports in the vicinity, increasing collision risks for some aircraft during the Proposed Action's operational time frame. However, more than 90% of existing air traffic in the analysis area would occur at altitudes that would not be impacted by the presence of WTGs (BOEM 2021). An air traffic flow analysis completed by Capitol Airspace found that it is possible that the FAA would be willing to increase the affected altitudes in order to accommodate wind development up to 873 feet above sea level (ASL) (Capitol Airspace Group 2020). Decommissioning would have impacts similar to those during Project construction. Therefore, the effects of the presence of structures on aviation and air traffic under the Proposed Action would be **negligible** adverse**.**

Vessel traffic: Vessel traffic associated with the Proposed Action would result in increased vessel traffic in the Lease Area and around ports. Addition of offshore structures would noticeably increase navigational complexity along transit routes between ports and construction sites, and locally around ports. Increased vessel traffic is expected to have a **negligible** adverse effect on aviation and air traffic because vessel traffic would be spread throughout a large geographic area and would be short term.

Onshore Activities and Facilities

Light: Operational lighting onshore would be limited to the OnSS and ICF, which would have minimal yard lighting and task lighting (see Section 3.14). This lighting is minimal and would not result in impacts to aviation and air traffic. Decommissioning would have impacts similar to those during Project construction. Therefore, the effects of light on aviation and air traffic under the Proposed Action would be **negligible** adverse**.**

Port utilization: Ports would be primarily used during construction and installation of the Proposed Action, as ports would be used for staging WTGs and for mobilizing construction work. Decommissioning would have impacts similar to those during Project construction. There would be no impacts to aviation and air traffic from O&M and decommissioning of the Proposed Action; therefore, impacts would be **negligible** adverse**.**

Presence of structures: The O&M of onshore structures to support the Proposed Action would not impact aviation and air traffic. This IPF would result in a **negligible** adverse impact because there would be no effect on this resource.

Vehicle traffic: Onshore vehicle traffic in and around ports and onshore facilities may increase as a result of O&M and decommissioning of the Proposed Action. Project-related vehicle traffic would not impact aviation and air traffic because these uses are generally spatially separate from vehicular traffic and occur in different locations. Therefore, this IPF would result in a **negligible** adverse impact because minimal increases in vehicle traffic would not impact aviation and air traffic.

3.17.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Aviation and air traffic: The Proposed Action would result in approximately 4,416 construction flight hours per year during construction and installation over a 2-year construction period, then the flight hours would significantly decrease to approximately 8.4 flight hours per year during O&M and decommissioning of the RWF. During construction and installation this results in a 7% increase in general aviation air traffic in the GAA and during O&M and decommissioning this results in a 0.01% increase in general aviation air traffic in the GAA. In total, there would be an average of 303 flight hours per year over 32 years (2-year construction period and up to 35-year operational period). This represents a 4% yearly increase in helicopter flight hours in the GAA and a 1% yearly increase in general aviation flight hours. Future offshore wind activities without the Proposed Action could also result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning of future wind projects. While the exact increase in future Project-related flights is unknown, it is anticipated that reasonably foreseeable future wind activities would also result in increases in flight traffic similar in scale to the Proposed Action. The Proposed Action and reasonably foreseeable future wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in **negligible** adverse impacts on aviation and air traffic.

Light: The Proposed Action would add permanent lighting for up to 100 WTGs and 2 OSSs for the duration of the Project. BOEM estimates a maximum cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the GAA. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidelines to minimize collision and allision risks. WTGs would also be visible on aircraft radar. Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would be similar to those impacts described under the No Action Alternative and would have a **negligible** adverse impact on aviation and air traffic.

Port utilization: The Proposed Action combined with reasonably foreseeable future actions could result in a very minimal increase in vessel use at ports, most of which would be during construction and decommissioning of the Project. The number of construction vessels would increase due to both the Proposed Action and reasonably foreseeable future actions, which could result in delays and congestion at ports and lead to potential conflicts with air traffic due to increased activity in the vicinity of the airports listed in the Affected Environment. Port improvements and construction activities in or near ports may require alteration of navigation patterns at nearby airports. Navigational hazards and collision risks at ports and in transit routes would be reduced as construction is completed, and all navigation hazards and collision risks would be gradually eliminated during decommissioning as offshore WTGs are removed. However, vessel traffic would also be spread among multiple ports to ensure sufficient capacity exists at each port and in each waterway. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in a **negligible** adverse impact on aviation and air traffic.

Presence of structures: The Proposed Action structures represent a 10% increase over total estimated WTG and OSS foundations across the GAA under the No Action Alternative. BOEM estimates a cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the RI/MA WEA. WTGs could have maximum blade tip height of 1,171 feet amsl.

Addition of these structures would noticeably increase navigational complexity and change aircraft navigation patterns in the region around the leased areas offshore Massachusetts and Rhode Island, along transit routes between ports and construction sites, and locally around ports (see Port utilization). These changes could compress lower-altitude aviation activity into more limited airspace in these areas, leading to airspace conflicts or congestion, and increasing collision risks for low-flying aircraft. However, open airspace around the GAA would still be available over the open ocean, and ports used for offshore WTG construction would be planned and developed to accommodate tall structures.

Open airspace would continue to exist around all Lease Areas after the Proposed Action and reasonably foreseeable future offshore wind energy projects are built. BOEM assumes that offshore wind project operators would coordinate with aviation interests throughout the planning, construction and installation, O&M, and decommissioning process to avoid or minimize impacts on aviation activities and air traffic. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable Project impacts would result in a **minor** adverse impact on aviation and air traffic.

<u>Vessel traffic:</u> Vessel traffic associated with the Proposed Action and reasonably foreseeable future actions would result in increased vessel traffic in the GAA. The impacts of increased vessel traffic are discussed above under Port Utilization and Presence of Structures. Vessel traffic would be spread throughout a large geographic area, and while construction time frames may overlap, it is anticipated that the increase in vessel traffic would not impact aviation and air traffic. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable Project impacts would result in a **minor** adverse impact on aviation and air traffic.

Onshore Activities and Facilities

<u>Lighting:</u> It is not anticipated that any of the onshore Project components for the Proposed Action or reasonably foreseeable future actions would require FAA-compliant lighting. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable Project impacts would result in **negligible** adverse impacts on aviation and air traffic from light.

<u>Port utilization:</u> WTG components located at staging ports could result in issuance of notices to airmen, causing some aircraft to reroute. WTG components would be in staging ports for brief periods. It is expected that reasonably foreseeable future actions would have similar port utilization impacts that account for construction and installation, O&M, and decommissioning of future actions. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse on aviation and air traffic.

<u>Presence of structures:</u> The construction and installation, O&M, and decommissioning of the Proposed Action and other reasonably foreseeable onshore structures would not contribute to cumulative impacts on aviation and aircraft because onshore structures are sited in industrial and commercial areas away from aviation uses. The presence of onshore structures would also be limited to O&M facilities, the OnSS, and ICFs that are similar in nature to surrounding land uses and would not create impacts on aviation uses. It is expected that reasonably foreseeable future actions would have similar structure impacts that account for construction and installation, O&M, and decommissioning of future actions. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **negligible** adverse on aviation and air traffic.

Vehicle traffic: Onshore vehicle traffic surrounding ports and onshore facilities may increase as a result of the Proposed Action, but it would not impact aviation and air traffic because these uses are spatially separate from vehicular traffic and occur in different locations. Additionally, it is anticipated that vehicular traffic would also increase at onshore wind facilities and port facilities as a result of reasonably foreseeable future actions. It is expected that vehicular traffic increases would be commensurate with the impacts expected for the Proposed Action in scale, intensity, and duration. Therefore, the Proposed Action combined with reasonably foreseeable future actions would result in a **negligible** adverse impact because minimal increases in vehicle traffic would not impact aviation and air traffic.

3.17.2.2.4 Conclusions

Project construction and installation, O&M, and decommissioning would affect ongoing aviation and air traffic occurring in the analysis area. Similar impacts from Project O&M would occur, although at a lesser extent and duration for aviation and air traffic. BOEM anticipates the impacts resulting from the Proposed Action alone would result in **negligible** adverse impacts on aviation and air traffic that would primarily be caused by installation of WTGs in the GAA due to potential changes in navigational patterns.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs range from **negligible** to **minor** adverse. 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 be **minor** adverse impacts for aviation and air traffic.

3.17.2.3 Alternative B: Impacts of the Proposed Action on Land-Based Radar

3.17.2.3.1 Construction and Installation

Offshore Activities and Facilities

Presence of structures: Construction and installation of offshore Project components could result in impacts to land-based radar by introducing potential obstacles to radar coverage in the RI/MA WEA. These impacts would be less than those identified for Project O&M and discussed in Section 3.17.2.3.2 Therefore, the construction and installation of offshore Project components would result in **negligible** adverse impacts to land-based radar.

Vessel traffic: There would be increased construction and operational vessel traffic from the Proposed Action, but the increase would not represent a substantial change to vessel traffic volume, which includes numerous ports and extensive marine traffic related to shipping, fishing, and recreation. As a result, the effects of vessel traffic on land-based radar under the Proposed Action would be **negligible** adverse.

3.17.2.3.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Presence of structures: WTGs that are near or in direct line of sight to land-based radar systems can interfere with the radar signal by causing shadows or clutter in the received signal. Construction of 102 structures in the Lease Area could lead to impacts to land-based radar systems identified in Appendix S2 of the COP. The RLOS analysis (Westslope 2021) determined the following radar impacts by the presence of WTGs at a height of 873 amsl:

- For the Falmouth ASR-8, wind turbines in the northeastern two-thirds of the study area would be within the line of sight of and would interfere with this radar site at a blade-tip height of 873 feet above ground level (AGL).[2]
- For the Nantucket ASR-9, wind turbines in the eastern one-half of the study area would be within the line of sight of and would interfere with this radar site at a blade-tip height of 873 feet AGL.
- For the Providence ASR-9, wind turbines in the entire study area would be within the line of sight of and would interfere with this radar site at a blade-tip height of 873 feet AGL.
- For the North Truro ARSR-4 and the Riverhead ARSR-4, wind turbines in the study area would not be within the line of sight of and would not interfere with these radar sites at a blade-tip height of 873 feet AGL.
- The EWR LOS analysis for the Cape Cod AFS EWR shows that wind turbines in the majority of the study area will be within the line of sight of this radar site and could have a significant impact on this early warning radar at a blade-tip height of 873 feet AGL.

For the Falmouth ASR-8, Nantucket ASR-9, and the Providence ASR-9, without mitigation, the radar effects due to clutter could include a partial loss of primary target detection and a number of false primary targets over and in the immediate vicinity of wind turbines within the radar line of sight in the study area. Other radar effects include a partial loss of weather detection and false weather indications over and in the immediate vicinity of wind turbines within the line of sight in the study area.

The HF radar LOS analyses show the following:

- For the Amagansett HF radar, wind turbines in the western corners of the study area would be within the line of sight of this radar site at a blade-tip height of 873 feet AGL.
- For the Block Island Long Range HF radar, Camp Varnum HF radar, Horseneck Beach State Reservation HF radar, Long Point Wildlife Refuge HF radar, and the Martha's Vineyard HF radar, wind turbines in the entire study area would be within the line of sight of these radar sites at a blade-tip height of 873 feet AGL.
- For the Block Island Standard Range HF radar, wind turbines in the western two-thirds of the study area would be within the line of sight of this radar site at a blade-tip height of 873 feet AGL.
- For the MVCO Meteorological Mast HF radar, wind turbines in the eastern one-fifth of the study area would be within the line of sight of this radar site at a blade-tip height of 873 feet AGL.
- For the Nantucket HF radar, wind turbines in the eastern one-third of the study area would be within the line of sight of this radar site at a blade-tip height of 873 feet AGL.
- For the Squibnocket Farms HF radar, wind turbines in the eastern one-fifth and along the northern edges of the study area would be within the line of sight of this radar site at a blade-tip height of 873 feet AGL.

[2] Height AGL used by Westslope (2021) is equivalent to height amsl as defined in Section 2.1.2.1, Table 2.1-1.

- For the Moriches HF radar, Nantucket Island HF radar, and the Nauset HF radar, wind turbines in the study area would not be within the line of sight of these radar sites at a blade-tip height of 873 feet AGL. Although wind turbines in the study area would not be within the line of sight of these radar sites, radar effects are still possible beyond line-of-sight due to the propagation of HF electromagnetic waves over the ocean surface.

Westslope (2021) concluded that, without mitigation, the Proposed Action could result in measurable effects on radar systems within their study area, including clutter in the vicinity of line-of-sight turbines and possibly in the vicinity of wind turbines beyond line-of-sight due to the propagation of HF electromagnetic waves over the ocean surface. These impacts could affect the following radar systems; the Amagansett HF radar, Block Island Long Range HF radar, Block Island Standard Range HF radar, Camp Varnum HF radar, Horseneck Beach State Reservation HF radar, Long Point Wildlife Refuge HF radar, Martha's Vineyard HF radar, MVCO Meteorological Mast HF radar, Nantucket HF radar, and the Squibnocket Farms HF radar.

The VOR screening analysis for the Martha's Vineyard VOR/DME, Providence VOR/DME, and the Sandy Point VOR/DME shows that the study area is greater than 8 nm from these navigational aid sites. Although possible, Revolution Wind does not anticipate that the FAA would have concerns with wind turbines in the study area at a blade-tip height of 873 feet AGL based on impacts to these navigational aid sites.

The NEXRAD weather radar screening analysis for the Boston WSR-88D and the Brookhaven WSR-88D shows that wind turbines in the study area would not be within the line of sight of and would not interfere with these radar sites at a blade-tip height of 873 feet AGL. The results also show that wind turbines in the study area at a blade-tip height of 873 feet AGL would fall within a NOAA green No Impact Zone for these radar sites.

The TDWR screening analysis for the Boston TDWR shows that the study area is beyond the instrumented range of this radar site. As such, no additional analysis was considered necessary for this radar site. In summary, there would be a **minor** adverse impact to air defense and homeland security radar and a **negligible** adverse impact on weather radar.

To address these concerns, BOEM would include terms and conditions in the COP approval requiring 30- to 60-day advanced notification to the North American Aerospace Defense Command ahead of Project completion and when the Project is complete and operational for radar management (RAM) scheduling, funding of RAM execution, and curtailment for national security or defense purposes, as described in the leasing agreement. Any other impacts on radar systems are anticipated to be mitigated by overlapping coverage and radar optimization. The FAA would evaluate potential impacts on radar systems, as well as mitigation measures, when Revolution Wind refiles Form 7460-1 for individual WTGs located within U.S. territorial waters. Revolution Wind's marine coordinator would remain on duty for the life of the Proposed Action to liaise with military, national security, civilian, and private interests to reduce potential radar conflicts. BOEM's (2020) study of radar interference concludes that HF SeaSonde radars, which monitor ocean currents, follow oil spills, and track powered and adrift vessels, are the most heavily impacted radar by offshore wind projects because WTGs create a phenomenon in which turbine echo is processed by these radar as current echo, resulting in interference with ocean current measurements. General mitigation measures determined by BOEM (2020) to be effective for HF radar include event-based operational changes and modification of some land-based radar. Event-based operational change may include wind farm curtailment agreements for BOEM lease areas that would cease wind farm operations when HF radar efficiency is essential, such as in the event of a severe hurricane/tropical storm or a large oil spill. BOEM is also working on developing a land-based HF radar software upgrade (BOEM 2020).

The Proposed Action includes 1 × 1–nm WTG spacing that reduces, but does not eliminate, navigational complexity and space use conflicts during the operation phases of the Project. Navigational complexity in the area would remain constant during simultaneous operations and would decrease as the Project is decommissioned and structures are removed. The final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) concludes that general mitigation measures, such as properly trained radar operators, properly installed and adjusted vessel equipment, marked wind turbines, and the use of AIS all enable safe navigation with minimal loss of radar detection. Following the layout recommendations in the final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) would improve safety, but it would not completely remove the risk of allisions or collisions with WTGs during SAR operations (of people or marine mammals), particularly in challenging weather or visibility conditions. Therefore, the effects of the presence of offshore structures on land-based radar under the Proposed Action would be **negligible** adverse**.**

<u>Vessel traffic:</u> Operational vessel traffic from the Proposed Action is expected to increase, although it would be less than during the construction and decommissioning phases. This could impact land-based radar by increasing the number of vessels in the analysis area. The Proposed Action includes 1 × 1–nm WTG spacing that allows more space for vessels to navigate and would help reduce potential interference on radar systems. As a result, the effects of vessel traffic on land-based radar under the Proposed Action would be **negligible** adverse**.**

3.17.2.3.3 Cumulative Impacts

Offshore Activities and Facilities

<u>Presence of structures:</u> The Proposed Action would result in long-term negligible adverse impacts to land-based radar when compared to conditions under the No Action Alternative. These structures would increase the long-term risk of radar interference or clutter.

BOEM's radar study (2020) suggests general mitigation measures, including event-based operational changes and modification of some land-based radar through software upgrades to reduce impacts. For vessel-based radar, the Final Massachusetts and Rhode Island Port Access Route Study (USCG 2020) concludes that general mitigation measures, such as properly trained radar operators, properly installed and adjusted vessel equipment, marked wind turbines, and the use of AIS, all enable safe navigation with minimal loss of radar detection. BOEM would include approval conditions in the COP regarding notification to North American Aerospace Defense Command of RAM scheduling, funding of RAM execution, and curtailment for national security or defense purposes, as needed.

Therefore, the Proposed Action and past, present, and reasonably foreseeable activities would result in **minor** adverse impacts to land-based radar.

<u>Vessel traffic:</u> The Project Action would result in an increase of offshore vessels during every phase of the Project. The increase in vessels in the analysis area would result in long-term impacts to land-based radar due to increased potential for radar interference or clutter. Reasonably foreseeable activities are

expected to also generate vessel traffic that would increase the number of vessels in the RI/MA WEA. Measures described under Presence of structures would reduce the cumulative impacts of increased vessel traffic to a **minor** adverse level when considering cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities.

3.17.2.3.4 Conclusions

Project construction and installation, O&M, and decommissioning would affect land-based radar occurring in the analysis area. Similar impacts from Project O&M would occur, although at a lesser extent and duration for some uses. BOEM anticipates the impacts on land-based radar resulting from the Proposed Action alone would be **minor** adverse, as the overall effect would be managed through event-based operational changes and radar equipment upgrades.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from **negligible** to **minor** adverse. Considering all the IPFs together, BOEM anticipates that the overall cumulative impacts associated with the Proposed Action combined with past, present, and reasonably foreseeable activities, would be **moderate** adverse for land-based radar.

3.17.2.4 Alternative B: Impacts of the Proposed Action on Military and National Security (including Search and Rescue)

3.17.2.4.1 Construction and Installation

Offshore Activities and Facilities

<u>Anchoring and new cable emplacement/maintenance:</u> Anchoring and mooring activities would occur during offshore wind energy development within the analysis area as part of the Proposed Action. This would involve increased vessel traffic which could impact military and national security uses by increasing the number of vessels within the analysis area. The presence of construction vessels could cause military vessels to change course or otherwise alter operations and could increase demand for SAR. These impacts are expected to be limited to cable emplacement corridors. Cable laying vessels are expected to travel slowly, typically at speeds of less than 1 knot, resulting in a low risk of collision with other vessels. In addition, it is anticipated that the USCG would establish temporary 500-yard navigation safety zones around each WTG foundation and each cable laying vessel, further reducing risk of contact with other vessels. Therefore, the effects of anchoring and new cable emplacement and maintenance under the Proposed Action on military and national security would be **negligible** adverse**.**

<u>Aviation and aircraft traffic:</u> Construction and installation of the Proposed Action would result in a 7% increase in general aviation in the GAA. Please refer to Section 3.17.2.2.1 for analysis of the Project's construction and installation impacts. The effects of this IPF on military and national security under the Proposed Action would be **minor** adverse, as there would be increased air traffic that could increase navigational complexities for military aircraft in the GAA.

<u>Light:</u> The Proposed Action would result in an increase in temporary construction aviation warning lighting on WTGs offshore. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize allision risks. Implementation of navigational lighting and marking per FAA and BOEM requirements and guidelines would further reduce

the risk of military aircraft collisions. This would result in a general increase of lights in the analysis area, which could have **minor** adverse impacts on military and national security by increasing the amount of light in the geographical analysis area.

Presence of structures: Access by military vessels to the RWF and RWEC would be limited during installation; however, USCG air- and waterborne SAR activities would still occur as needed. The addition of up to 100 WTGs, two OSSs, and two RWECs would increase the risk of allisions for military vessels for up to 35 years during Project operations, particularly in bad weather or low visibility. Military vessel traffic within the RI/MA WEA has historically been relatively low (four vessels recorded in 2016 and 2017), and deep-draft military vessels are not anticipated to navigate outside navigation channels unless necessary for SAR operations (BOEM 2021). Additionally, construction of the Proposed Action could attract recreational fishing or sightseeing vessels, which would add to the number of vessels operating in the area to complete construction of these Project elements. The presence of construction-related vessels and additional recreational vessels would add to conflict or collision risks for military and national security vessels and could increase demand for SAR operations. *The Areas Offshore of Massachusetts and Rhode Island Port Access Route Study* (USCG 2020) examined potential navigation SAR issues associated with anticipated offshore wind development in the RI/MA WEA. The USCG report concluded that a wind turbine array that follows a standard and uniform grid pattern with three lines of orientation and standard spaces, as proposed for the Project, would maintain the Coast Guard's ability to conduct SAR operations within the Lease Area (USCG 2020). BOEM (2020) acknowledges, however, that some SAR operations are aided by land-based radar vessel tracking, as well as wind and current tracking to extrapolate disabled vessel distance and direction, which can be inhibited by the presence of WTGs, and suggests mitigation related to radar equipment and event-based operational changes to counteract these effects. The navigational safety risk assessment found there are an average of 1.5 missions expected per year in the Lease Area (DNV GL Energy USA 2020). Therefore, it is anticipated that the presence of Project-related structures would impact some future USCG SAR missions. The presence of offshore wind infrastructure could require adjusting the operational parameters for such missions; however, the impact is anticipated to be minimal based on the uniform spacing of structures for waterborne SAR and other vessel maneuverability and mitigation for land-based radar.

Construction of the Proposed Action would necessitate use of stationary lift vessels within the RWEC, cranes in ports during construction, and FAA-regulated structures temporarily in transit routes between port and the WEA, increasing navigational complexity and changing navigational patterns for vessels and aircraft operating in the area around the WEA during construction and operations. Increased navigational complexity would increase the risk of collisions and allisions for military and national security vessels or aircraft within the WEA, and could increase demand for SAR. Structures would be marked as a navigational hazard per FAA, BOEM, and USCG requirements, and risk would be consistent within the 35-year operational period. It is anticipated that the USCG would establish temporary 500-yard (457-meter) navigation safety zones around each WTG foundation and each installation vessel, reducing risk of contact with other vessels The Project's 1 × 1–nm spacing reduces some of the risk of collisions and allisions. Based on the above impacts, the Project would have **minor** to **moderate** adverse impacts on military operations, including SAR, and national security due to the presence of structures.

Vessel traffic: There would be increased construction and operational vessel traffic from the Proposed Action. This could impact military and national security uses by increasing the number of vessels in the analysis area. The RWF's proposed 1 × 1–nm spacing would result in sufficient space between foundations for vessels to navigate. UCSG establishment of temporary safety zones around cable laying vessels and foundation construction sites would further minimize the potential for construction vessel conflicts with military vessels. As a result, the effects of vessel traffic on military and national security uses under the Proposed Action would be **minor** adverse**.**

3.17.2.4.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

<u>Anchoring and new cable emplacement/maintenance:</u> Anchoring and mooring activities would occur during offshore wind energy O&M and decommissioning within the analysis area as part of the Proposed Action. This would involve increased vessel traffic which could impact military and national security uses by increasing the number of vessels within the analysis area. However, the impacts are expected to be small and infrequent during O&M and decommissioning of offshore Project elements. Therefore, the effects of anchoring and new cable emplacement/maintenance under the Proposed Action on military and national security would be **negligible** adverse.

<u>Aviation and aircraft traffic:</u> O&M of the Proposed Action would result in a 0.01% increase in annual general aviation traffic in the GAA. Please refer to Section 3.17.2.2.2 for analysis of the Project's O&M impacts. The increase in vessel traffic associated with Project O&M could result in an increased demand for SAR, and increased military aircraft traffic in and around the RWF. Therefore, the effects of this IPF on military and national security activities under the Proposed Action, including SAR, would be **negligible** adverse.

<u>Light:</u> The O&M and decommissioning of the Proposed Action would result in an increase in permanent lighting on WTGs offshore until decommissioning is complete. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize collision risks. This would result in a general increase of lights in the analysis area, which could have a small impact on military and national security. The addition of permanent lighting would be an ongoing impact; therefore, the effects of light on military and national security under the Proposed Action would be **minor** adverse.

<u>Presence of structures:</u> The addition of up to 100 WTGs and up to two RWECs would increase risk of allisions for military vessels for up to 35 years during Project operations, particularly in bad weather or low visibility. Military traffic within the RI/MA WEA has historically been relatively low (four vessels recorded in 2016 and 2017), and deep-draft military vessels are not anticipated to navigate outside navigation channels unless necessary for SAR operations (BOEM 2021). Additionally, the Proposed Action could create an artificial reef effect until decommissioning is complete, attracting species of interest to recreational fishing or sightseeing, and attracting additional recreational fishing and sightseeing vessels that would be additive to existing vessel traffic in the area. The presence of additional recreational vessels would add to conflict or collision risks for military and national security vessels and could increase demand for SAR operations. Therefore, the Project would have **minor** adverse impacts on military operations and national security.

<u>Vessel traffic:</u> There would be increased operational vessel traffic from the Proposed Action. This could impact military and national security uses by increasing the number of vessels in the analysis area. The

RWF's proposed 1 × 1–nm spacing would result in more space for vessels to navigate and would help reduce conflicts with military vessels. As a result, the effects of vessel traffic on military and national security uses under the Proposed Action would be **minor** adverse**.**

3.17.2.4.3 Cumulative Impacts

Offshore Activities and Facilities

Anchoring and new cable emplacement/maintenance: Up to 19,526 acres could be affected by anchoring and mooring activities and cable installation during offshore wind energy development within the analysis area as part of the Proposed Action and other reasonably foreseeable future actions. This offshore energy facility construction of new cable emplacement and maintenance of cables would involve increased vessel traffic, which could impact military and national security uses by increasing the number of vessels within the analysis area. Increased vessel traffic due to anchoring and cable maintenance of wind facilities could lead to course changes of military vessels, thereby increasing navigational complexity and risk of collisions. However, these impacts are expected to be limited to cable emplacement corridors which would result in contact with cable emplacement and maintenance vessels of expected from the Proposed Action and future offshore wind activities. Therefore, the cumulative effects of anchoring and new cable emplacement and maintenance would be a **minor** adverse impact on military and national security.

Aviation and aircraft traffic: The Proposed Action would result in a measurable increase in general aviation traffic in the GAA during construction and installation, as well as decommissioning, which is expected to be similar in aviation traffic volumes and construction and installation. The Proposed Action would result in a negligible effect on aviation traffic during O&M of the RWF. Other planned and potential future offshore wind projects could also result in increased air traffic due to the use of helicopters and other aircraft during construction and installation, O&M, and decommissioning. While the aviation requirements of other reasonably foreseeable offshore wind activities are unknown, it is anticipated that the aviation requirements for construction and O&M of these projects would be similar to those for the Proposed Action. Construction of these projects may occur concurrently between now and 2030 and, with a conservative 7% increase in aircraft traffic for all aircraft types in the GAA, the cumulative increase in air traffic during the construction period would be additive. Once projects are operational, cumulative O&M air traffic would likely result in a 0.1% increase in aviation traffic for all aircraft. The Proposed Action and reasonably foreseeable future wind projects would be required to engage the FAA in flight planning to avoid impacts to civilian, commercial, government, and military aviation operations. Therefore, the Proposed Action when combined with past, present, and other reasonably foreseeable project impacts would result in **minor** adverse impacts on military and national security.

Light: The Proposed Action would result in an increase in permanent aviation warning lighting on WTGs offshore. All existing stationary structures would have navigation marking and lighting in accordance with FAA, USCG, and BOEM guidance to minimize collision risks and optimize aviation safety. This would result in a general increase of lighting in the GAA, adding to vessel, navigation, onshore housing, and port lighting, which could impact military and national security uses. The Project, in combination with other reasonably foreseeable future actions, could result in the addition of up to 1,138 lighted structures in the analysis area. Therefore, because Project activities combined with reasonably foreseeable activities would result in an increase in lighted structures offshore, the cumulative impacts of light on military and national security would be **minor** adverse.

Presence of structures and vessel traffic: The Proposed Action would require approximately 970 construction vessel trips per construction day over the 2-year construction period. This vessel activity would increase the risk of collisions, allisions, and spills. However, the Proposed Action represents approximately 2% of typical vessel traffic in the GAA. Therefore, the Proposed Action would result in **negligible** adverse impacts to military and national security uses.

BOEM estimates a peak of 380 vessels due to offshore wind project construction over a 10-year time frame. Although the number of construction vessels would represent a large portion of the traffic in the region, most vessels would remain in the Maximum Work Area, with fewer vessels transporting materials back and forth from ports. With multiple offshore wind projects under construction, traffic would also be spread among multiple ports to ensure that sufficient capacity exists at each port and in each waterway. Additionally, BOEM also anticipates that coordination with military and national security interests would be ongoing during construction and installation, O&M, and decommissioning activity.

The Proposed Action would result in noticeable impacts to military and national security through the installation and operation of up to 100 WTGs and two OSSs, along with stationary lift vessels and cranes during construction, to conditions under the No Action Alternative, for a total of 1,138 structures within the GAA. The Proposed Action structures represents a 10% increase over total estimated WTG and OSS foundations across the GAA under the No Action Alternative.

Project structures are likely to generate artificial reef effects that lead to increased abundance of commercially and recreationally desirable fish and shellfish within wind farm boundaries. This could in turn lead to an increase in commercial and recreational vessel traffic and activity in and around wind farms. Increased vessel traffic and presence of structures would therefore contribute to an increase the short-term and long-term collision and allision risks for military and national security vessels, as well as search and rescue vessels. However, deep-draft military vessels are not anticipated to transit outside navigation channels unless needed for search and rescue. Potential allision risks if these vessels lost power would be minimized through the Proposed Action’s 1 ×1–nm WTG spacing. BOEM also anticipates that coordination with military and national security interests would be ongoing during construction and installation, O&M, and decommissioning.

Changing navigation patterns could also concentrate vessels within and around the outsides of the RI and MA Lease Areas, potentially causing space use conflicts in these areas or reducing the effectiveness of SAR operations. While the addition of Project structures and associated construction vessels would also increase navigational complexity or alter navigation patterns for military and national security aircraft operating in the region, Project structures would be marked as a navigational hazard per FAA, BOEM, and USCG guidelines and WTGs would be visible on military and national security vessel and aircraft radar. The Proposed Action would implement a 1 × 1–nm spacing, consistent with all other projects in the RI/MA WEA.

Therefore, the cumulative impacts associated with the Proposed Action when combined with past, present, and reasonably foreseeable activities would consist predominately of impacts described under the No Action Alternative, which would be **moderate** adverse for presence of structures and **minor** adverse for vessel traffic on military and national security.

3.17.2.4.4 Conclusions

Project construction and installation, O&M, and decommissioning would affect ongoing military uses in the analysis area. Similar impacts from Project O&M would occur, although at a lesser extent and duration for some uses. BOEM anticipates that the impacts resulting from the Proposed Action alone that range from interference with ongoing military and national security activities to an expected increase in demand for SAR would range from negligible to moderate adverse. Therefore, BOEM expects the overall impact on military and national security from the Proposed Action alone to be **minor** adverse.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from **negligible** adverse to **moderate** adverse. 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 be **moderate** adverse for military uses.

3.17.2.5 Alternative B: Impacts of the Proposed Action on Scientific Research and Surveys (see section in main EIS)

3.17.2.6 Alternative B: Impacts of the Proposed Action on Undersea Cables

3.17.2.6.1 Construction and Installation

Offshore Activities and Facilities

<u>Presence of structures:</u> Up to 100 WTGs, two OSS foundations, and two RWECs would be installed as part of the Proposed Action. The RWEC would cross up to seven identified subsea assets within the installation corridor, including three telecommunications cables.

The presence of the Project could preclude future submarine cable placement in the RWF and RWEC, although there are no future cables identified for location within this area. The presence of the RWF would likely require routing of future undersea cables around the Lease Area. Cable crossings of the RWEC would necessarily include mapping and installation of cable protection at the crossing location, standard design techniques for undersea cable installation. The impacts from foundation construction would be **minor** adverse while the installation of the RWECs would be **negligible** adverse. The overall impact from presence of structures on undersea cables would be **minor** adverse.

<u>Vessel traffic:</u> Increased vessel traffic due to construction and installation of the Proposed Action could interfere with vessels used to install or maintain existing and future undersea cables. Increased construction vessel traffic due to Project construction could lead to course changes of vessels used for undersea cable maintenance and installation and increased traffic along vessel transit routes. Additionally, there would be increased risk for allisions with vessels used for construction of undersea cables. These effects during the construction and installation phase are expected to be minimal and short term. Therefore, the effects of vessel traffic on undersea cables under the Proposed Action would be **negligible** adverse.

3.17.2.6.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Presence of structures: Up to 100 WTGs, two OSS foundations and two RWECs would be installed as part of the Proposed Action. The presence of the Project could preclude future submarine cable placement. O&M of the Project would be less likely to interfere with future undersea cable development than construction and decommissioning. OSS and WTG foundations would have a larger footprint compared to the RWECs, which are buried, and therefore would be more likely to preclude future undersea cable development. Once the foundations are constructed, impacts from foundation O&M and decommissioning would be **minor** adverse and O&M and decommissioning of RWECs would be **negligible** adverse. The overall impact from presence of structures on undersea cables is **minor** adverse.

Vessel traffic: Increased vessel traffic due to O&M and decommissioning of the Proposed Action could interfere with vessels used to install or maintain existing and future undersea cables. Additionally, there is increased risk for allisions with vessels used for undersea cable O&M. However, given the infrequency of required maintenance at any given location along a cable route, this risk is expected to be low. These effects during the construction and installation phase are expected to be minimal and short in duration. Therefore, the effects of vessel traffic on undersea cables under the Proposed Action would be **negligible** adverse.

3.17.2.6.3 Cumulative Impacts

Offshore Activities and Facilities

Presence of structures: The Proposed Action would result in long-term impacts to existing undersea cables through the installation of up to 100 WTGs and two OSSs to conditions under the No Action Alternative. BOEM estimates a cumulative total of up to 1,138 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the RI/MA WEA.

Construction of the foundations associated with the Proposed Action and reasonably foreseeable future actions could increase the complexity of undersea cable development by requiring routing around the facilities. Export cables are unlikely to preclude future undersea cable development because cable crossings can be protected using standard design techniques. Therefore, in context of reasonably foreseeable environmental trends, the overall impacts from the presence of structures resulting from the Proposed Action and planned actions are anticipated to be localized long term **negligible** because impacts can be avoided by routing design and standard cable protection techniques.

Vessel traffic: Vessel traffic related to construction and O&M of undersea cables is expected to increase if new undersea cables are constructed and as ongoing maintenance is required. Additionally, there would be increased vessel traffic due to the Proposed Action and reasonably foreseeable future actions. The risk of allision to cable maintenance vessels could increase as more offshore wind energy projects are constructed. However, given the infrequency of required maintenance at any given location along a cable route, this risk is expected to be low. Therefore, the cumulative impact from vessel traffic on undersea cables is **negligible** adverse.

3.17.2.6.4 Conclusions

Project construction and installation, O&M, and decommissioning would affect undersea cables occurring in the GAA. Similar impacts from Project O&M would occur, although at a lesser extent and duration for some uses. BOEM anticipates the impacts resulting from the Proposed Action alone would be **negligible**. Therefore, BOEM expects the overall impact on other uses from the Proposed Action alone to be **negligible** adverse for undersea cables.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would be **negligible**. 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 be **negligible** adverse impacts for undersea cables.

3.17.2.7 Alternatives C, D, E, and F: Aviation and Air Traffic

Table 3.17-1 provides a summary of IPF findings by alternative.

3.17.2.7.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated inter-array cables, which would have an associated reduction in associated vessel and equipment use and air emissions, BOEM expects that the impacts resulting from each alternative alone would be **negligible** adverse to the Proposed Action. The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **minor** adverse impacts for aviation and air traffic.

3.17.2.8 Alternatives C D, E, and F: Land-Based Radar

Table 3.17-1 provides a summary of IPF findings by alternative.

3.17.2.8.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated inter-array cables, which would have an associated reduction in associated vessel and equipment use and air emissions, BOEM expects that the impacts resulting from each alternative alone would be the same as the Proposed Action: **minor** adverse. The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **moderate** adverse impacts for land-based radar.

3.17.2.9 Alternatives C, D, E, and F: Military and National Security (including Search and Rescue)

Table 3.17-1 provides a summary of IPF findings by alternative.

3.17.2.9.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated inter-array cables, which would have an associated reduction in associated vessel and equipment use and air emissions, BOEM expects that the impacts resulting from each alternative alone would be similar to the Proposed Action: **minor** adverse. The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **moderate** adverse for military uses and national security.

3.17.2.10 Alternatives C, D, E, and F: Scientific Research and Surveys (see section in main EIS)

3.17.2.11 Alternatives C, D, E, and F: Undersea Cables

Table 3.17-1 provides a summary of IPF findings by alternative.

3.17.2.11.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated inter-array cables, which would have an associated reduction in associated vessel and equipment use and air emissions, BOEM expects that the impacts resulting from each alternative alone would be the same as the Proposed Action: **negligible** adverse. The overall impacts of Alternatives C through F when combined with past, present, and reasonably foreseeable activities would therefore be the same as under the Proposed Action: **negligible** adverse for undersea cables.

3.17.2.12 Mitigation

Mitigation measures for other uses (land-based radar and military and national security) proposed by BOEM and other cooperating agencies are listed in Appendix F, Table F-2 and here in more detail in Table 3.17-2. Not every other uses category has proposed mitigation measures; aviation and air traffic and undersea cables do not.

Table 3.17-2. Proposed Mitigation Measures – Other Uses (land-based radar and military and national security)

Mitigation Measure	Description	Effect
Land-based Radar		
Operational mitigation for ARSR-4 and ASR-8/9 radar	Mitigation for ASR-8/9 radar: • Passive aircraft tracking using ADS-B or signal/transponder • Increasing aircraft altitude near radar • Sensitivity time control (range-dependent attenuation) • Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates) • Track initiation inhibit, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals) Modification mitigations for ARSR-4 and ASR-8/9 systems include using the dual beams of the radar simultaneously and using in-fill radar. Additional conditions for COP approval to mitigate potential impacts on ASR-8/9 include notifying the North American Aerospace Defense Command 30 to 60 days ahead of Project completion and when the Project is complete and operational for Radar Adverse-impact Management	These measures would reduce the anticipated minor adverse impacts to air defense and homeland security radar systems.

Mitigation Measure	Description	Effect
	(RAM) scheduling, contributing funds toward execution of the RAM, and curtailment of operations for national security or defense purposes.	
Mitigation for oceanographic HF radar	WTG operators sharing real-time surface current telemetry, other oceanographic data, and wind turbine operational data with radar operators would serve to aid interference mitigation. Mitigation would also include a wind farm curtailment agreement. Additional modifications identified for oceanographic HF radar systems include signal processing enhancements and antenna modifications.	These measures would complement existing EPMs and further reduce anticipated negligible impacts to weather radar and minor adverse impacts on SAR activities.
Mitigation for NEXRAD weather radar systems	Research is underway for potential to mitigate weather radar using phased array radars to achieve a null in the antenna radiation pattern in the direction of the wind turbine. Additional mitigation includes a wind farm curtailment agreement.	This measure would further reduce anticipated negligible impacts on weather radar systems.
Military and National Security		
Fiber-optic sensing technology	Distributed fiber-optic sensing (DFOS) technology proposed for the wind energy project or associated transmission cables would be reviewed by the DOD to ensure that DFOS is not used to detect sensitive data from DOD activities, to conduct any other type of surveillance of U.S. government operations, or to otherwise pose a threat to national security.	This measure would reduce potential adverse impacts to military and national security.
WTG shut-down mechanism	Equip all WTG rotors (blade assemblies) with control mechanisms to enable remote shutdown of requested WTGs by the USCG. A formal shut-down procedure would be part of the standard operating procedures and periodically tested. Normally, USCG-ordered shutdowns would be limited to those WTGs in the immediate vicinity of an emergency and for as short a period as is safely practicable under the circumstances, as determined by the USCG.	This measure would reduce potential adverse impacts to military and national security.
Operational mitigation for ARSR-4 and ASR-8/9 radar	Mitigation for ASR-8/9 radar: • Passive aircraft tracking using ADS-B or signal/transponder • Increasing aircraft altitude near radar • Sensitivity time control (range-dependent attenuation) • Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates) • Track initiation inhibit, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals) Modification mitigations for ARSR-4 and ASR-8/9 systems include using the dual beams of the radar simultaneously and using in-fill radar. Additional conditions for COP approval to mitigate potential impacts on ASR-8/9 include notifying North American Aerospace Defense Command 30 to 60 days ahead	These measures would reduce the anticipated minor adverse impacts to air defense and homeland security radar systems.

Mitigation Measure	Description	Effect
	of Project completion and when the Project is complete and operational for RAM scheduling, contributing funds toward execution of the RAM, and curtailment of operations for national security or defense purposes.	
Mitigation for oceanographic HF radar	Through data sharing from turbine operators of real-time surface current telemetry, other oceanographic data, and wind turbine operational data with radar operators into the public domain to aid interference mitigation. Mitigation would also include a wind farm curtailment agreement. Additional modifications identified for oceanographic high-frequency radar systems include signal processing enhancements and antenna modifications.	These measures would complement existing EPMs and further reduce anticipated negligible impacts to weather radar and minor adverse impacts on SAR activities.
Mitigation for NEXRAD weather radar systems	Research is underway for potential to mitigate weather radar using phased array radars to achieve a null in the antenna radiation pattern in the direction of the wind turbine. Additional mitigation includes a wind farm curtailment agreement.	This measure would further reduce anticipated negligible impacts on weather radar systems.

3.18 Recreation and Tourism

3.18.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Recreation and Tourism

Geographic analysis area: The GAA for recreation and tourism (Figure 3.18-1) comprises all Project components plus a 40-mile radius around the Lease Area. The area covers approximately 6,113 square miles of open ocean, 1,488 square miles of land, and over 1,008 miles of shoreline, and coincides with the Project's visual impact assessment (EDR 2021) to 1) address Project visibility from visually sensitive resources located within New York, Connecticut, Rhode Island, and Massachusetts and 2) encompass all locations where BOEM anticipates recreation impacts associated with Project construction and installation, O&M, and decommissioning.

Affected environment: Recreation and tourism play a major role in the leisure pursuits of local residents and the coastal economies of the states affected by the Project (see Section 3.9 and Section 3.11). NOAA collects economic data for six sectors dependent on the ocean and Great Lakes: living resources, marine construction, marine transportation, offshore mineral resources, ship and boat building, and tourism and recreation. Tourism and recreation statistics from NOAA's Economics: National Ocean Watch are good indicators of coastal and ocean tourism because they estimate the ocean-dependent portion of business for hotels and restaurants by including only those establishments located in shore-adjacent zip code areas, and they exclude all forms of sports and entertainment that are not ocean-related. A summary of economic data for counties and states that fall within the recreation and tourism analysis area is aggregated in Table 3.18-1. As of 2018, ocean economy sectors accounted for 3% to 22% of the total economy for affected counties and states. Tourism and recreation were the substantive sources of economic activity for most locations.

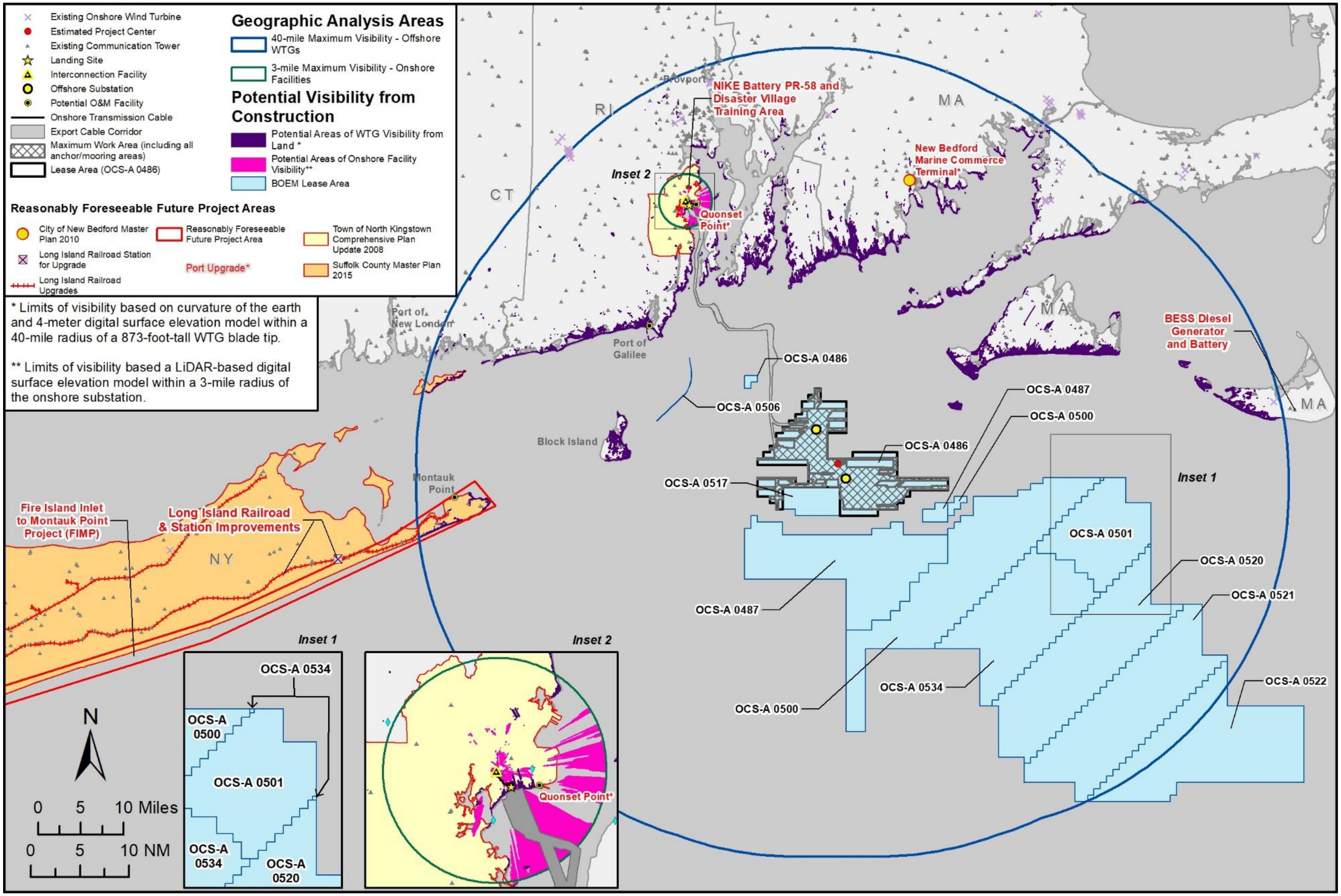

Figure 3.18-1. Geographic analysis area for recreation and tourism.

Table 3.18-1. Ocean Economies for Counties and States that Would be Directly or Indirectly Affected by the Project

Location	% of Total 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 Gross Domestic Product for Tourism and Recreation (% of total gross domestic product generated by ocean economy)
Suffolk County, NY	6%	36,385 (87.9%)	921.1 million (70.1%)	1.9 billion (73.4%)
New London, CT	17%	7,397 (36.2%)	176.5 million (12.9%)	374.3 million (15.5%)
Washington, RI	21%	6,032 (53.5%)	145.2 million (31.6%)	327.6 million (27.6%)
Kent, RI	10%	7,338 (96.4%)	148.5 million (91.7%)	321.8 million (93.0%)
Providence, RI	6%	14,803 (92.1%)	326.3 million (84.8%)	700.0 million (87.9%)
Bristol, RI	17%	1,977 (86.8%)	46.5 million (76.8%)	96.1 million (72.6%)
Bristol, MA	3%	2,963 (48.9%)	55.0 million (19.1%)	105.8 million (16%)
Newport, RI	21%	6,976 (82.0%)	184.4 million (54.2%)	444.1 million (56.8%)
Plymouth, MA	5%	9,180 (87.5%)	203.8 million (71.2%)	400.9 million (71.3%)
Barnstable, MA	19%	17,028 (94.0%)	489.3 million (87.9%)	1.1 billion (87.0%)
Dukes, MA	16%	1,394 (97.5%)	52.9 million (96.1%)	120.1 million (96.9%)
Nantucket, MA	22%	1,668 (99.5%)	71.2 million (99.7%)	159.7 million (99.8%)

Source: NOAA (2020)

Notes: CT = Connecticut, MA = Massachusetts, NY = New York, RI = Rhode Island.

The analysis area for recreation and tourism supports a wide range of inland, shoreline or beach, and ocean-based recreation and tourist activities, including 16 water trails, more than 1,000 conservation areas, nearly 1,000 hiking trails, New Bedford Whaling National Historical Park, several hundred designated SCUBA diving areas, and 78 marinas (Northeast Ocean Data 2021). Recreational activities include beach-going, boating (for pleasure and competition), walking-hiking, swimming, surfing, metal detecting, horseback riding, camping, stand-up paddleboarding, cross-country skiing, kite sailing, and scenic-bird-nature viewing. The *Ocean State Outdoors Rhode Island's Comprehensive Outdoor Recreation Plan* (Rhode Island DEM 2019) identifies visiting coastal areas-beaches as one of the top three outdoor activities by Rhode Island residents. Likewise, Connecticut's statewide survey identifies beach activities as the top water-related recreation activity by residents (Center for Public Policy & Social Research 2017). Road or trail biking, birdwatching, and camping are also activities reported as displaying a relatively high degree of participation. Based on a broader study encompassing the northeast United States, the five most popular activities in the northeast region are beachgoing (61.9%), scenic enjoyment-sightseeing (50.2%), watching marine life (33.7%), photography (32.5%), and collecting non-living resources-beachcombing (27.4%) (Bloeser et al. 2015). The same study notes that surfing, stand-up paddleboarding, and triathlon typically occurred in nearshore bay-protected waters.

Locally, Blue Beach, a public beach, is approximately 500 feet west of the southwest corner of the Project's proposed 20-acre landfall envelope. Blue Beach is accessed via a trail located west of the Hayward Industries, Inc. building, which is just outside the landfall envelope. Compass Rose Beach, another public beach, is approximately 2,600 feet east of the southeast corner of the landfall envelope. The Martha's Vineyard Fast Ferry dock is directly east of Compass Rose Beach. The North Kingstown Golf Course is approximately 2,000 feet north of the northern edge of the landfall envelope and is separated by Roger Williams Way.

Boating in the analysis area includes ocean-going vessels down to small boats used by residents and tourists in sheltered waters. A 2012 survey of recreational boaters along the northeastern U.S. coast found that more than half (52.4%) of recreational boating occurred within 1 nm of the coastline (Starbuck and Lipsky 2013). In 2011, NOAA estimated that 93% of the 2011 recreational boating from Massachusetts occurred within 3 nm of shore (BOEM 2012). However, several long-distance sailboat races may pass through the offshore portions of analysis area, depending on the route selected for a particular year; these races include the Transatlantic Race, Marion to Bermuda Race, and Newport to Bermuda Race. Although these sailing events occur along the entire Long Island coastline, they are generally small (averaging less than 50 racing vessels). Larger sightseeing boats also travel to offshore locations where sightings of whales are more likely.

Recreational fishing along the shoreline and the pursuit of highly migratory species (HMS) such as tuna, shark, swordfish, and billfish are also popular recreational activities in the analysis area. In the nearby Vineyard Wind Lease Area, the recreational fishing effort for HMS occurs seasonally from June to October using a wide range of fishing methods, although mobile fishing methods predominate (Kneebone and Capizzano 2020). Coxes Ledge, The Fingers, and The Claw all support the highest level of recreational fishing for HMS (see Section 3.9 for additional discussion of recreational fishing activities and trends).

Although many of the above-listed publicly available recreation and tourism activities are free, local businesses also offer boat rentals and numerous recreation experiences such as private boat-cruise charters; canoe, kayak, and stand-up-paddleboard touring; whale watching; deep-sea fishing charters; and scuba diving in the analysis area. These tourism activities also support other local businesses, including non-ocean-related leisure, hotels, and restaurants.

Recreation and tourism in the GAA are noticeably higher in the spring, summer, and fall when the ambient air and water temperatures are comfortable (Parsons and Firestone 2018).

3.18.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential recreation and tourism impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

Offshore Activities and Facilities

Anchoring and new cable emplacement/maintenance: Construction of future projects would increase the number of anchored vessels and work platforms used for survey and construction purposes. Applying 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 2019), up to 2,160 acres of anchoring could occur under the No Action Alternative in the recreation and tourism GAA. The presence of anchored vessels could increase navigation complexity for recreational vessels. Increased turbidity from anchoring could also briefly alter the behavior of species important to recreational fishing (see Section 3.9) and sightseeing (primarily whales, but also dolphins and seals). However, most anchored construction-related vessels would be located within temporary safety zones (anticipated to be established and monitored by offshore wind developers). Likewise, most anchoring would occur outside the area most commonly used for recreational boating, which would prevent most conflicts for recreational uses. Anchoring activities would also be temporary and localized; therefore, construction-related anchoring impacts from future projects would be **minor** adverse. Anchoring impacts to fish species used for recreational fishing are addressed in Section 3.9.

Up to 10,148 acres of seafloor disturbance could occur from IAC and export cable installation within the recreation and tourism GAA (see Appendix E4, Table E4-1). As with anchoring, installation of offshore cables would temporarily increase navigation complexity for recreational vessels present around work areas and reduce recreational opportunities if individuals prefer to avoid the noise and disruption caused by installation. Cable installation could also have temporary impacts on individual fish and invertebrates of interest for recreational fishing due to dredging, turbulence, and disturbance; however, no population-level species impacts would occur. Once installed, buried cables typically have no maintenance unless a fault or failure occurs. Smaller vessel anchors would not penetrate to the typical target cable burial depth (4 to 6 feet), and recreational vessel anchoring is uncommon in water depths where offshore structures would be installed. However, scour protection for cables and foundations could hinder boat anchoring and result in gear entanglement or loss if recreational activity coincides with scour protection areas. If project-related seafloor hazards are not noted on charts, operators could lose anchors, leading to increased risks associated with drifting vessels that are not securely anchored. Therefore, new cable emplacement and maintenance would result in temporary to long-term **minor** adverse impacts.

Light: Construction of future planned offshore projects would require nighttime lighting on WTGs, vessels, and platforms that could be visible by onshore recreational users and tourists, as well as offshore boaters recreating at night or in low-light conditions. O&M of the estimated 936 WTGs in the GAA would require permanent aviation warning lights that could be visible from some beaches and coastlines and could impact recreation and tourism if recreation decisions are influenced by lighting. Field observations made from the mainland shoreline during WTG operations at the Block Island Wind Farm indicated that at nighttime and under clear skies, the turbine lights were visible with the naked eye up to 26.75 miles (23.2 nm) (HDR 2019). A University of Delaware study evaluating the impacts of visible offshore WTGs on beach use found that WTGs visible more than 15 miles from the viewer would have negligible adverse impacts on businesses dependent on recreation and tourism (Parsons and Firestone 2018). Likewise, a 2017 study on the impact of offshore wind facilities on vacation rental prices found that nighttime views of aviation hazard lighting (without ADLS) for WTGs close to shore (5 to 8 miles) would adversely impact the rental price of properties with ocean views (Lutzeyer et al. 2017). However, the study did not specifically address the relationship between lighting, nighttime views, and tourism for WTGs located farther from shore.

A 2013 BOEM study evaluated the impacts of WTG lighting on birds, bats, marine mammals, sea turtles, and fish. The study found that existing guidelines “appear to provide for the marking and lighting of [WTGs] that would pose minimal if any impacts on birds, bats, marine mammals, sea turtles or fish” (Orr et al. 2013). By extension, existing lighting guidelines or ADLS (if implemented) would not impact recreational fishing or wildlife viewing opportunities.

Lighting impacts would be most pronounced for views that can be currently characterized as undeveloped, where lighting from human infrastructure and activities is not dominant or even exists. However, less than 5% of the lighted WTG positions envisioned in the GAA would be within 15 miles from coastal locations. Therefore, visual impacts on recreation and tourism would be short term during construction and long term during O&M, with **negligible** to **moderate** adverse impacts, based on the observed distance and individual responses by recreationists and visitors to changes in the viewshed.

Noise: Construction noise from offshore activities from planned future projects such as pile driving, trenching, and construction-related vessels would intrude upon the natural sounds of the marine environment. Pile driving is the loudest aspect of most planned future projects. Most pile driving would occur far enough offshore that that work would be inaudible from onshore locations or from typical recreational fishing locations (within 1 mile of the coast). However, pile driving and other construction noise could cause some offshore boaters and recreational fishers to avoid areas of noise-generating activity, although the loudest noise would be within the temporary safety zones (with restricted recreational and tourism vessel access) anticipated to be established for each project by offshore wind developers. Additionally, because some fish species are sensitive to underwater sound, construction noise could cause fish to move away from the noise source, which could adversely affect recreational fishing opportunities near work areas. Construction noise could also contribute to impacts on marine mammals, with resulting impacts on marine sightseeing that relies on the presence of mammals, primarily whales. However, as noted in Section 3.15, no population-level marine mammal effects are anticipated.

Most of the anticipated offshore O&M noise from future projects would be from continuous WTG operations farther offshore. Sound pressure levels would be at or below ambient levels at relatively short distances from WTG foundations (Kraus et al. 2016). Field observations made during normal operations at the Block Island Wind Farm minimally exceeded ambient levels at 164 feet from the WTG base. These field observations also concluded that WTG operational noise from the Block Island Wind Farm was not detectable from shore and further suggested that as wind speeds increase (causing increased ambient noise), the associated increase in operational noise of the WTG becomes less detectable (HDR 2019). Therefore, noise from offshore activities would result in temporary to long-term **minor** adverse impacts.

Presence of structures: The placement and operation of up to 953 foundations (see Table E4-1 in Appendix E4) are proposed within the recreation and tourism GAA. Recreational impacts associated with in-water structures would include the risk of recreational vessel allision and collision, fishing gear entanglement, vessel damage or loss, increased navigation hazards, and visual impacts.

Offshore routes for recreational boaters, anglers, sailboat races, and sightseeing boats could require adjustment to avoid allision risks with in-water structures. Generally, the vessels more likely to allide with WTGs or OSSs would be smaller vessels capable of moving within and near wind installations. Examples include recreational fishing (especially HMS fishing), long-distance sailboat races, sightseeing boats, and large sailing vessels. Sailing vessels with tall masts that could be affected by in-water structures, like WTGs and associated platforms, could choose to avoid offshore in-water structures. However, the adverse impact of the future offshore wind structures on recreational boating would be limited by the distance offshore. As previously noted, a 2012 survey of recreational boaters along the northeastern United States coast found that the highest density of recreational vessels occurs within 1 nm of the coastline (Starbuck and Lipsky 2013). Likewise, a 2020 study of recreational boaters in the RI/MA WEA found that wind facilities are unlikely to have significant impacts on recreational boaters because those boaters prefer to use waters closer to the coast. Most recreational boaters from Rhode Island ports who choose to visit the RI/MA WEAs would likely keep their distance from new structures, and increased abundance of targeted fish species near offshore wind facilities would have beneficial impacts on recreational fishing (Dalton et al. 2020). Based on these findings, under the No Action Alternative, most recreational vessels would not interact with proposed WTGs and OSS(s). However, WTGs could also attract recreational boaters and sightseeing vessels. These conditions could increase the number of congregating vessels and increase collision or allision risks (see Section 3.16 for additional discussion of navigation impacts). The USCG would need to adjust their search and rescue planning and search patterns to allow aircraft to fly within the GAA, as described in greater detail in Section 3.17.

HMS fisheries are further offshore than most fisheries and therefore more likely to overlap with future offshore wind development. The greatest amount of recreational HMS fishing effort in southern New England from 2002 through 2018 occurred west of the RI/MA WEA (Kneebone and Capizzano 2020), although HMS fishing also occurred in specific locations within the RI/MA WEA, including The Dump, Coxes Ledge, The Fingers, and The Claw (see Section 3.9). Commonly used mobile methods for HMS angling such as trolling and drifting could be incompatible with the presence of WTGs and OSSs, depending upon weather conditions and specific techniques. For example, trolling could involve trailing many feet of lines and hooks behind the vessel and then following large pelagic fish once they are hooked, posing navigational and maneuverability challenges around WTGs. Scour protection used for in-water foundations would also increase risk of recreational fishing gear loss or damage by entanglement and present a hazard for anchoring (see new cable placement above). These concerns notwithstanding, new in-water structures could result in several long-term beneficial impacts including increased recreational fishing by introducing new aquatic habitats (see Section 3.9) and increased tourism by people interested in viewing the structures (see Section 3.18.2.2.2). New in-water structures could also create foraging opportunities for seals, small odontocetes, and sea turtles (see Sections 3.15 and 3.19), which could offer recreational sightseeing opportunities.

Visual impacts from the presence of vertical structures on the offshore horizon would create a visual contrast contrary to the horizontal plane of the ocean's water surface and the line at the visual horizon that separates the ocean from sky. Studies and surveys that have evaluated the impacts of offshore wind facilities on tourism found that established offshore wind facilities in Europe did not result in decreased tourist numbers, tourist experience, or tourist revenue, and that Block Island's WTGs provide excellent sites for fishing and shellfishing (Smythe et al. 2018). The proximity of WTGs to shore may be correlated to recreational experience. As noted in Parsons and Firestone (2018), different changes to beach experience occurred based on distance to visible WTGs. Reported trip loss (respondents who stated that they would visit a different beach without offshore wind) averaged 8% when wind projects were 12.5 miles (20 km) offshore, 6% when 15 miles (24.1 km) offshore, and 5% when 20 miles (32 km) offshore. Conversely, approximately 2.6% of respondents were more likely to visit a beach with visible offshore wind facilities at any distance. A 2019 survey of coastal recreation users in New Hampshire (Ferguson et al. 2020) also found that most users (77%) supported offshore wind development along the New Hampshire coast, 74% anticipated that offshore wind development would have a neutral to beneficial impact on their recreational activities, and 26% anticipated that offshore wind development would have an adverse impact (Ferguson et al. 2020).

Based on the currently available studies, portions of nearly all 936 WTGs associated with the No Action Alternative could be visible from shorelines (depending on vegetation, topography, weather, atmospheric conditions, and the viewers' visual acuity), of which up to 38 WTGs (fewer than 5%) would be within 15 miles of shore (see Section 3.20 for details). WTGs visible from some shoreline locations in the GAA would have adverse impacts on visual resources when discernable because of the introduction of industrial elements in previously undeveloped views. Visual impacts would be more pronounced in views lacking development and outside of heavy recreation use times (i.e., when crowds of beachgoers do not impact the visitor's experience of the natural elements of the landscape). Based on the research cited above, the impact of visible structures on recreation would be long term and **moderate** adverse but unlikely to impact shore-based or marine recreation and tourism in the GAA as a whole. Visual impacts to tribes that may be present or travel to the GAA for recreation or tourism purposes are disclosed in Section 3.10.

<u>Vessel traffic:</u> Future projects would generate increased nearshore and offshore vessel traffic, primarily during construction, along routes between ports and the offshore wind construction areas. 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 2019), vessel activity could peak in 2025 with as many as 276 vessels involved in the construction of reasonably foreseeable projects (see Section 3.16.1.1). Increased vessel traffic would require increased alertness on the part of recreational or tourist-related vessels and could result in minor delays or route adjustments, particularly if more than one future offshore wind facility is under construction at the same time. The likelihood of vessel collisions would increase as a result of the higher volumes of vessel traffic during construction. However, most of the moving construction-related vessels would be located within temporary safety zones (anticipated to be established and monitored by offshore wind developers), which would prevent most conflicts for recreational uses. These activities would also be temporary and localized. Although long-term increased traffic volumes from O&M of future projects would be low, they would add to existing in-water vessel traffic and therefore present **minor** long-term adverse impacts on recreational users.

Onshore Activities and Facilities

Anchoring and new cable emplacement/maintenance: No anchoring impacts would occur as a result of future onshore activities. However, onshore construction and installation of future wind facilities could affect recreation and tourism due to noise and activity at the landfall locations or along the onshore cable route if these locations intersect recreational or commercial uses. These **minor** adverse impacts would be unavoidable during construction but would be temporary and localized. No long-term cable impacts are anticipated because cables would be buried.

Light: Construction of some planned future onshore projects would require new visible structures or nighttime lighting on structures that could be visible by onshore recreational users and tourists. However, most onshore project components are anticipated to be in previously developed and lighted areas. Therefore, adverse effects of onshore lighting from construction would be short term and localized to discrete construction sites. Onshore O&M impacts from future projects would be variable based on project type (i.e., increased rail and road infrastructure use, increased port operational noise) but are anticipated to be long term with variable **minor** to **moderate** adverse impacts experienced based on the observed distance.

Noise: Construction noise from planned future projects onshore would be variable based on project type, but many projects would include one or more noise-generating activities such as earth moving, pile driving, trenching, jackhammering, and other similar large equipment operations. Recreational users could be subject to these construction noises anywhere future projects intersect public access areas, public recreational facilities, public roadways, or private and commercial facilities where tourism occurs (e.g., restaurants, shopping, and lodging establishments). Onshore construction noise from cable installation at the landfall locations, and inland if cable routes are near parkland, recreation areas, or other areas of public interest, would temporarily disturb the quiet enjoyment of the site (in locations where such quiet is an expected or typical condition). However, most of these onshore project components are anticipated to be in previously developed areas. Therefore, adverse effects of onshore noise from construction would be short term and localized to discrete construction sites. Onshore O&M impacts from future projects would be variable based on project type (i.e., increased rail and road infrastructure use, increased port operational noise) but are anticipated to be adverse and long term with variable **minor** to **moderate** adverse impacts experienced based on the distance to the noise source.

Vessel traffic: Future projects could increase onshore vehicle traffic or alter traffic patterns in a manner that inconveniences recreational users, primarily during construction near port facilities and on adjacent, existing roadways. Construction vehicles and construction areas would follow established safety guidelines that would prevent most conflicts for recreational uses. Impacts from onshore activities would be temporary and localized; therefore, construction impacts from future projects would not add to adverse impacts on recreational users. Although long-term increased traffic volumes from O&M activities of future projects would be relatively low, they would add to the existing onshore traffic and therefore present **minor**, localized long-term adverse impacts on recreational users.

3.18.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on recreation and tourism associated with the Project would not occur. However, ongoing and future activities would have continuing short-term to long-term impacts on recreation and tourism, primarily due to the interruption of access and introduction of new offshore hazards, as well as new aquatic habitat and increased tourism/recreation opportunities.

BOEM anticipates that the range of individual IPF impacts for reasonably foreseeable offshore wind activities would be **negligible** to **moderate** adverse and **minor** beneficial, primarily due to the presence of offshore structures. As described in Appendix E1, BOEM anticipates that the range of individual IPF impacts for ongoing activities and reasonably foreseeable activities other than offshore wind would be **minor** to **moderate** adverse.

Considering all the IPFs together, BOEM anticipates that the overall impact associated with all reasonably foreseeable environmental trends and activities would result in **minor** adverse impacts on recreation and tourism because most adverse impacts could be avoided, would not disrupt normal or routine recreation and tourism functions, or would return to a condition with no measurable effects after activity ends.

3.18.2 Environmental Consequences

3.18.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

This assessment analyzes the maximum-case scenario; however, there is the potential for variances in the proposed Project build-out, as defined in the PDE (see Appendix D). The Project design parameters that would influence the magnitude of the impacts on recreation and tourism consists of the number and type of WTGs installed. Impacts on recreational fishing and boating are based on the installation of 100 WTGs and two OSSs, for a total of 102 foundations in the GAA. If Revolution Wind were instead to install 59 12-MW WTGs, the maximum height of the blade tip for WTGs would be 873 feet above the surface, compared to 648 feet for the 8-MW WTGs. Because the WTGs would exceed 699 feet, FAA regulations require supplemental mid-tower lighting, in addition to lighting at the top of the nacelle (FAA 2018). The taller WTGs and additional lighting would result in greater visual impacts within the GAA. However, the 12-MW WTG option would reduce the number of WTGs and IAC; therefore, navigational complexity for offshore recreation users would be reduced compared to the 8-MW WTG option.

Revolution Wind has committed to implementing ADLS (as described in Appendix F) as a measure to reduce the duration of lighting impacts. Revolution Wind would also establish temporary safety zones around construction areas and work with the USCG to communicate these zones and other work areas to the boating public via local Notices to Mariners. These EPMs would be implemented across all alternatives; therefore, BOEM would not expect measurable potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for recreation and tourism across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Appendix E1 Table E2-10.

Table 3.18-2 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

The Conclusion section within each alternative analysis discussion includes rationale for the effects determinations. All of the action alternatives would include both adverse and beneficial effects. Overall, these effects to recreation and tourism across all alternatives would be **minor** adverse because they would be small, and the resource would be expected to recover completely with no mitigating action required.

Table 3.18-2. Alternative Comparison Summary for Recreation and Tourism

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Anchoring and new cable emplacement/ maintenance	**Offshore**: Most anchoring would occur outside the area most commonly used for recreational boating, which would prevent most conflicts for recreational uses. Anchoring activities would also be temporary and localized; therefore, construction-related anchoring impacts from future projects would be **minor** adverse. Smaller vessel anchors would not penetrate to the typical target cable burial depth (4 to 6 feet), and recreational vessel anchoring is uncommon in water depths where offshore structures would be installed. However, scour protection for cables and foundations could hinder boat anchoring and result in gear entanglement or loss if recreational activity coincides with scour protection areas. If project-related seafloor hazards are not noted on charts, operators could lose anchors, leading to increased risks associated with drifting vessels that are not securely anchored. Therefore, new cable emplacement and maintenance would result in temporary to long-term **minor** adverse impacts.	**Offshore**: Installation of offshore cables and anchoring would temporarily restrict recreation access within the cable routes. Revolution Wind would implement a comprehensive communication plan during offshore construction to inform all mariners, including commercial and recreational fishermen and recreational boaters, of construction activities and vessel movements. Temporary safety zones around each WTG site and each cable-laying vessel (anticipated to be established and monitored by Revolution Wind) would minimize potential conflicts for recreational uses. Potential O&M anchoring impacts would be similar to the construction phase, but reduced due to fewer anchored vessels. Therefore, potential changes in navigation routes due to Proposed Action would constitute a temporary, **minor** adverse impact. Cable installation could also affect fish and mammals of interest for recreational fishing and sightseeing through dredging and turbulence, although no population-level impacts are expected, resulting in short-term **minor** adverse impacts. Up to approximately 5,338 acres of anchoring and 14,157 acres of cabling seafloor disturbance could occur from ongoing and planned actions, including the Proposed Action, in the recreation and tourism GAA. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** adverse cumulative impacts on recreation and tourism.	**Offshore**: Alternatives C through F would reduce the number of WTG foundations and scour protection associated with the IAC. This could reduce risks associated with gear entanglement or loss if recreational activity coincides with scour protection areas. Reduced IAC installation could also negligibly decrease turbidity that could alter the behavior of species important to recreational fishing (see Section 3.9) and marine mammal sightseeing. During O&M, no impacts are anticipated because RWEC, IAC, and OSS transmission cable typically have no maintenance requirements unless a fault or failure occurs. Approximately 3,974 to 5,121 acres of anchoring and 14,157 acres of cabling seafloor disturbance could occur from ongoing and planned actions, including Alternatives C through F. Project-related construction anchorages would noticeably add to disturbances of marine species and their habitats important to recreational fishing and could require recreational and tourism vessels to navigate around moving and anchored construction-related vessels while in transit. The buried cabling would also present short-term navigational hazards. Therefore, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** adverse cumulative impacts on recreation and tourism.			
	Onshore: Onshore construction and installation of future wind facilities could affect recreation and tourism due to noise and activity at the landfall locations or along the onshore cable route if these locations intersect recreational or commercial uses. These **minor** adverse impacts would be unavoidable during construction but would be temporary and localized.	**Onshore:** Installation of onshore cables would be localized. No direct impacts to public parks, beaches, or other public recreational facilities would occur. Therefore, recreation and tourism impacts during construction would be temporary and **minor** adverse. No onshore cable maintenance would be required unless a fault or failure occurs. Therefore, cumulative, O&M, and decommissioning impacts would represent a **negligible** adverse impact on recreational users.	**Onshore:** Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Light	**Offshore:** Visual impacts on recreation and tourism would be short term during construction and long term during O&M, with **negligible to moderate** adverse impacts, based on the observed distance and individual responses by recreationists and visitors to changes in the viewshed.	**Offshore:** Visual impact assessment prepared for Revolution Wind (see COP Appendix U3 [EDR 2021]) determined that the Project would not likely be easily detectable when viewed from a distance of 20 miles or more and that only 3% of the land area within the visual study area would contain views of the Project. Therefore, visual impacts on recreation and tourism would be temporary during construction, with **negligible** to **moderate** adverse impacts, based on the observed distance. The Proposed Action's aviation warning lighting, when visible, would add a developed/industrial visual element to views that were previously characterized by dark, open ocean during O&M. Due to the limited duration and frequency of such events and the distance of WTGs from shore, however, visible aviation hazard lighting for the Proposed Action would result in a long-term intermittent **negligible** adverse impact on recreation and tourism. Given the distance from recreational viewers and atmospheric interference, lighting from the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in long-term intermittent **minor** adverse cumulative impacts on recreation and tourism.	**Offshore:** Construction of offshore components would likely require less time for Alternatives C through F than anticipated for the Proposed Action, and could lead to reduced potential lighting impacts due to a smaller number of installed WTGs. Therefore, Alternatives C through F would have **negligible** to **moderate** adverse impacts. Alternatives C through F would also reduce nighttime O&M lighting as compared to the Proposed Action, due to required aviation hazard lighting of fewer WTGs, plus the two OSSs. Due to the limited duration and frequency of such events and the distance of WTGs from shore, however, visible aviation hazard lighting would still only result in a long-term negligible adverse impact on recreation and tourism. Offshore construction activities would add new WTGs and two OSSs to the No Action Alternative. Construction vessels would employ navigational safety lighting, and offshore structures would employ aviation and navigation hazard lighting. New lighting from Alternatives C through F would contribute a 7% to 10% increase to in-water lighting sources from past, present, and reasonably foreseeable future projects within the GAA by introducing built visual elements to views previously characterized by dark, open ocean. Collectively, only approximately 2% to 5% of the WTG positions envisioned in the GAA would be less than 15 miles from coastal locations for any given alternative. Given the distance from recreational viewers and atmospheric interference, lighting from Alternatives C through F, when combined with past, present, and reasonably foreseeable projects, would result in long-term intermittent **minor** adverse cumulative impacts on recreation and tourism.			
	Onshore: Construction of some planned future onshore projects would require new visible structures or nighttime lighting on structures that could be visible by onshore recreational users and tourists. Onshore O&M impacts from future projects would be variable based on project type) but are anticipated to be long term with variable **minor** to **moderate** adverse impacts experienced based on the observed distance.	**Onshore**: Light from onshore construction activities could temporarily adversely impact the recreation experience of users if present or traveling on roads near the landing site, onshore cable route, and proposed onshore facilities. However, as previously noted, no public parks, beaches, or other public recreational facilities are within or immediately adjacent to this onshore route, OnSS, or ICF. For nighttime construction work, downward-facing portable floodlights would be used in compliance with all safety and security and local government requirements. Therefore, for most locals and tourists, any adverse impacts would be temporary, **minor**, and inconvenient but would not cause a loss to their overall experience. Operational lighting for the OnSS and ICF would comply with Quonset Development Corporation lighting regulations and be mounted with the lamp horizontal to the ground (light facing straight down) or with a lamp tilt no more than 25 degrees from the horizon. As such, it is anticipated that the OnSS and ICF would result in long-term **negligible** adverse lighting impacts to the recreation and tourism activities in the GAA. Construction associated with the Proposed Action could add temporary **minor** adverse light impacts experienced by onshore recreational users near the landfall work area, onshore transmission cable route, or onshore facilities or from the aviation hazard lighting on the new WTGs. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in temporary **minor** adverse cumulative impacts to onshore recreation and tourism.	**Onshore:** Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** to **minor** and temporary to long term.			

Impact-Producing Factor	**No Action Alternative**	**Alternative B (Proposed Action) up to 100 WTG**	**Alternative C (Habitat Alternative) 64–65 WTGs**	**Alternative D (Transit Alternative) 78–93 WTGs**	**Alternative E (Viewshed Alternative) 64–81 WTGs**	**Alternative F (Higher Capacity Turbine Alternative) 56 WTGs**
Noise	**Offshore**: Pile driving is the loudest aspect of most planned future projects. Most pile driving would occur far enough offshore that that work would be inaudible from onshore locations or from typical recreational fishing locations (within 1 mile of the coast). However, pile driving and other construction noise could cause some offshore boaters and recreational fishers to avoid areas of noise-generating activity, although the loudest noise would be within the temporary safety zones (with restricted recreational and tourism vessel access) anticipated to be established for each project by offshore wind developers. Most of the anticipated offshore O&M noise from future projects would be from continuous WTG operations farther offshore. Field observations also concluded that WTG operational noise from the Block Island Wind Farm was not detectable from shore and further suggested that as wind speeds increase (causing increased ambient noise), the associated increase in operational noise of the WTG becomes less detectable (HDR 2019). Therefore, noise from offshore activities would result in temporary to long-term **minor** adverse impacts.	**Offshore**: Construction noise could result in impacts on recreation and tourism through displacement of species important to recreational fishing and sightseeing in and around construction areas, resulting in a short-term **moderate** adverse impact to fishing, shellfishing, or whale-watching activities. Offshore construction and onshore cable installation near the landfall area at Quonset Point in North Kingstown, Rhode Island, could have short-term **negligible** to **minor** adverse impacts on the recreational enjoyment of the marine and coastal environments. Offshore operational noise from the WTGs would be similar to the noise described for other projects under the No Action Alternative and would thus have long-term **minor** adverse impacts. Because of the distance from receptors, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in localized short-term **minor** to **moderate** adverse cumulative impacts on recreation and tourism due to construction activities, whereas noise from O&M activities would result in long-term **negligible** adverse cumulative impacts.	**Offshore**: Alternatives C through F would negligibly decrease noise associated with pile driving for WTGs as compared to the Proposed Action, resulting in short-term **moderate** adverse impacts. Operational noise sources and levels would also be similar to, but slightly lower than the Proposed Action, resulting in long-term **minor** adverse impacts. Construction activities would add noise from pile driving for foundations proposed under Alternatives C through F, and offshore dredging for the export and inter-array cabling to the ambient noise levels of the No Action Alternative. Noise from construction could lead to the displacement of fish in and around construction sites, leading to spatial competition, depending on migrating patterns. Recreational boaters and tourists would not be permitted to approach active construction zones and would therefore not be expected to experience noise impacts from offshore construction. Because of the distance from receptors, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in localized, short-term **minor** to **moderate** adverse cumulative impacts on recreation and tourism due to construction activities, whereas noise from O&M activities would result in long-term **negligible** cumulative impacts.			
	Onshore: Construction noise from planned future projects onshore would be variable based on project type, but many projects would include one or more noise-generating activities such as earth moving, pile driving, trenching, jackhammering, and other similar large equipment operations. Onshore O&M impacts from future projects would be variable based on project type but are anticipated to be adverse and long term with variable **minor** to **moderate** adverse impacts experienced based on the distance to the noise source.	**Onshore**: Noise from onshore construction activities could temporarily adversely impact the recreation experience of users if present or traveling on roads near the landing site, onshore cable route, and proposed onshore facilities. However, as previously noted, no public parks, beaches, or other public recreational facilities are within or immediately adjacent to this onshore route, OnSS, or ICF. Therefore, for most locals and tourists, any adverse impacts would be temporary, **minor**, and inconvenient but would not cause a loss to their overall experience. Operations of onshore Project components (i.e., offshore to onshore transition joint bays, onshore transmission cable route, OnSS, and ICF) would have **negligible** adverse noise impacts intermittently over the life of the Project to onshore recreation and tourism because these components would only require periodic routine maintenance. As with lighting, construction activities would add noise from the construction of onshore facilities to the ambient noise levels of the No Action Alternative. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in temporary **minor** adverse cumulative impacts to onshore recreation and tourism.	**Onshore**: Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** to **minor** and temporary to long term.			

Impact-Producing Factor	**No Action Alternative**	**Alternative B (Proposed Action) up to 100 WTG**	**Alternative C (Habitat Alternative) 64–65 WTGs**	**Alternative D (Transit Alternative) 78–93 WTGs**	**Alternative E (Viewshed Alternative) 64–81 WTGs**	**Alternative F (Higher Capacity Turbine Alternative) 56 WTGs**
Presence of structures	**Offshore**: Recreational impacts associated with in-water structures would include the risk of recreational vessel allision and collision, fishing gear entanglement, vessel damage or loss, increased navigation hazards, and visual impacts: The impact of visible structures on recreation would be long term and **moderate** adverse but unlikely to impact shore-based or marine recreation and tourism in the GAA as a whole.	**Offshore**: Offshore structures would impact recreation and tourism through increased navigational complexity, risk of allision or collision, attraction of recreational vessels to offshore wind structures for fishing and sightseeing, increased risk of fishing gear loss or damage by entanglement due to scour or cable protection, and potential difficulties in anchoring over scour or cable protection. Revolution Wind would minimize these **minor** to **moderate** adverse impacts through the navigation- and fishing-related EPMs listed in Appendix F. Based on the duration of Project activity and observed distance, visual contrast associated with the Proposed Action could have a beneficial, adverse, or neutral impact on the quality of the recreation and tourism experience depending on the viewer's orientation, activity, and purpose for visiting the area. Additionally, construction of offshore Project components could elicit a long-term **minor** beneficial impact through an increase in curiosity, recreational fishing and diving activity. New structures related to the Proposed Action would noticeably increase navigational complexity; risks of structure allision; route adjustments for races, sightseeing, and fishing; loss and damage of fishing gear to scour and cable protection; viewshed changes; and difficulty anchoring over scour and cable protection. However, new in-water structures from the Proposed Action could benefit recreation and tourism by attracting recreational vessels to WTGs for fishing and sightseeing activities. Therefore, new in-water structures from the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** to **moderate** adverse and long-term **minor** beneficial cumulative impacts on recreation and tourism.	**Offshore**: Alternatives C through F would reduce the number of WTGs, potentially allowing for improved maneuverability for recreational vessels through the Lease Area. The Habitat Alternative could also negligibly reduce visual impacts as compared to the Proposed Action, depending on the observable distance and individual responses to a view of offshore wind farms (see Section 3.20 for details). Alternatives C through F would add foundations to the 953 foundations estimated for the No Action Alternative within the GAA. New structures would add to the long-term impacts on recreation and tourism throughout the life of the Project (up to 35 years, plus up to an additional 2 years for decommissioning) by increasing navigational complexity; risks of structure allision; route adjustments for races, sightseeing, and fishing; loss and damage of fishing gear to scour and cable protection; and difficulty anchoring over scour and cable protection. Based on visual simulations from onshore locations, some seaside locations could experience reduced recreational and tourism activity as a result of visible in-water structures, but the visibility of large offshore structures is not expected to impact shore-based recreation and tourism as a whole. New in-water structures could also benefit recreation and tourism by attracting recreational vessels to WTGs for fishing and sightseeing activities. Therefore, new in-water structures from the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** to **moderate** adverse and long-term **minor** beneficial cumulative impacts on recreation and tourism.			
	Onshore: Not applicable	**Onshore**: Inland residential/commercial areas and recreational sites would generally be screened from construction views due to the presence of existing development combined with forested areas (see COP Appendix U1). Therefore, any adverse impacts to overall recreator experience would be temporary and **minor** adverse impacts, but would not cause a loss to the overall recreator experience. The proposed OnSS and ICF would not be out of scale or character with the existing types of development currently present in the vicinity, such as the existing Davisville Substation or the structures at nearby Quonset Business Park. As such, it is anticipated that O&M of the OnSS and ICF would result in **negligible** adverse visual impacts to recreation and tourism activities in the GAA. New onshore structures would only result in **minor** adverse visual impacts experienced by recreational users due to the existing settings at these locations. When considered cumulatively with past, present, and reasonably foreseeable activities, the Proposed Action would result in temporary **negligible** to **minor** adverse cumulative visual impacts on recreation and tourism.	**Onshore:** Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **negligible** to **minor** adverse and temporary to long term.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Vessel traffic	**Offshore**: Future projects would generate increased nearshore and offshore vessel traffic, primarily during construction, along routes between ports and the offshore wind construction areas. Although long-term increased traffic volumes from O&M of future projects would be low, they would add to existing in-water vessel traffic and therefore present **minor** long-term adverse impacts on recreational users.	**Offshore**: Construction would result in as many as 61 construction vessels per construction day in 2023 and 2024 present at offshore work areas on a daily basis. However, the majority of recreational boating occurs within 1 nm of shore. Therefore, most recreational boaters in the GAA would experience a temporary **minor** adverse inconvenience from construction-related vessel traffic. The estimated low volume of O&M vessel traffic would not be anticipated to affect ongoing recreational use. O&M of the Proposed Action would therefore have **negligible** adverse impacts on onshore or offshore recreation and tourism. Project vessels would add to disturbances of marine species and their habitats important to recreational fishing and could require recreational and tourism vessels to navigate around moving construction-related vessels while in transit. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** adverse cumulative impacts on recreation and tourism.	**Offshore**: Construction of offshore components would likely require less time for Alternatives C through F than anticipated for the Proposed Action, and could lead to reduced potential navigational impacts for recreational users due to a smaller number of WTGs. Therefore, Alternatives C through F would have **negligible** to **minor** adverse impacts.			
	Onshore: Future projects could increase onshore vehicle traffic or alter traffic patterns in a manner that inconveniences recreational users, primarily during construction near port facilities and on adjacent, existing roadways. Although long-term increased traffic volumes from O&M activities of future projects would be relatively low, they would add to the existing onshore traffic and therefore present **minor**, localized long-term adverse impacts on recreational users.	**Onshore**: No public parks, beaches, or other public recreational facilities are immediately adjacent to the onshore route, OnSS, or ICF. Additionally, Revolution Wind would coordinate with local authorities during onshore construction to minimize local traffic impacts. Therefore, any adverse impacts to tourism or overall recreator experience would be temporary to long term and **minor** adverse.	**Onshore**: Alternatives C through F would not impact onshore activities; therefore, impacts would be the same as those described for the Proposed Action: **minor** and temporary to long term.			

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3.18.2.2 Alternative B: Impacts of the Proposed Action Alternative on Recreation and Tourism

3.18.2.2.1 Construction and Installation

Offshore Activities and Facilities

During construction, recreational offshore uses such as boating, fishing, diving, and wildlife and whale watching could be adversely impacted by Project activities. Detailed analysis by IPF is provided below. Construction EPMs would be implemented to minimize adverse impacts to recreators as practicable (see Table F-1 in Appendix F), including communication with vessel operators and implementation of ADLS.

Anchoring and new cable emplacement/maintenance: Anchoring could occur anywhere within the maximum work area under the Proposed Action, although impacts would be localized to specific anchoring sites and would be temporary in duration. The presence of as many as 61 construction vessels per construction day in 2023 and 2024 would increase navigation complexity for recreational vessels, requiring individual boats to navigate around Project vessels and work areas (see COP Table 3.3.10-2). Increased turbidity from anchoring could also briefly alter the behavior of species important to recreational fishing (see Section 3.9) and marine mammal sightseeing. However, temporary safety zones around each WTG site and each cable-laying vessel (anticipated to be established and monitored by Revolution Wind) would minimize potential conflicts for recreational uses. Anchoring activities would also be localized; therefore, construction impacts would represent a temporary, **minor** adverse impact on recreational users. Proposed Action anchoring impacts to fish species used for recreational fishing are addressed in Section 3.9.

Up to 4,009 acres of seafloor disturbance could occur from Proposed Action IAC and export cable installation within the recreation and tourism GAA. Installation of offshore cables would temporarily restrict recreation access within the cable routes. Recreational vessels traveling near the cable routes would also need to navigate around construction vessels. Revolution Wind would implement a comprehensive communication plan during offshore construction to inform all mariners, including commercial and recreational fishermen and recreational boaters, of construction activities and vessel movements. Communication would be facilitated through a fisheries liaison, a Project website, and public notices to mariners and vessel float plans (in coordination with the USCG). Therefore, potential changes in navigation routes due to Proposed Action construction would constitute a temporary, **minor** adverse impact.

Cable installation could also affect fish and mammals of interest for recreational fishing and sightseeing through dredging and turbulence, although no population-level impacts are expected (see Sections 3.13 and 3.9), resulting in short-term and **minor** adverse impacts on recreation and tourism.

Light: The Proposed Action would require nighttime lighting for construction vessels traveling to and working at the Project's offshore construction areas that could be visible by recreational users and tourists. The visual impact assessment prepared for Revolution Wind (see COP Appendix U3 [EDR 2021]) determined that the Project would not likely be easily detectable when viewed from a distance of 20 miles or more and that only 3% of the land area within the visual study area would contain views of the Project. Therefore, visual impacts on recreation and tourism would be temporary during construction, with **negligible** to **moderate** adverse impacts, based on the observed distance.

<u>Noise:</u> Construction noise could result in impacts on recreation and tourism through displacement of species important to recreational fishing and sightseeing in and around construction areas, resulting in a short-term **moderate** adverse impact to fishing, shellfishing, or whale-watching activities. Pile driving represents the loudest likely noise source during construction activities. Installation of a single monopile foundation is estimated to normally require 1 to 4 hours (6 to 12 hours maximum) of pile driving; up to three WTG monopile foundations would be installed in a 24-hour period. Therefore, recreational boaters near the RWEC and WTGs could also be temporarily inconvenienced by pile-driving noise.

Offshore construction and onshore cable installation near the landfall area at Quonset Point in North Kingstown, Rhode Island, could have short-term **negligible** to **minor** adverse impacts on the recreational enjoyment of the marine and coastal environments. This landing site is developed for military and industrial use; however, the closest public recreation area, Blue Beach, is located approximately 500 feet to the southwest of the Project's landfall envelope. Compass Rose Beach, another public beach, and Martha's Vineyard Fast Ferry are also located approximately 2,600 feet east of the southeast corner of the landfall envelope. Recreational users at these locations could experience temporary adverse impacts due to construction noise, if these noise levels exceed ambient noise conditions generated by ongoing industrial and port activities.

<u>Presence of structures:</u> The installation of up to 102 Project foundations are proposed within the recreation and tourism GAA. As also noted under the No Action Alternative, these offshore structures would impact recreation and tourism through increased navigational complexity, risk of allision or collision, attraction of recreational vessels to offshore wind structures for fishing and sightseeing, increased risk of fishing gear loss or damage by entanglement due to scour or cable protection, and potential difficulties in anchoring over scour or cable protection. Revolution Wind would minimize these **minor** to **moderate** adverse impacts through the navigation- and fishing-related EPMs listed in Appendix F. As part of these EPMs, Revolution Wind would establish temporary safety zones around construction areas and work with the USCG to communicate these zones and other work areas to the boating public via local Notices to Mariners. Additionally, the majority of recreational boating would occur more than 10 miles from Proposed Action WTGs and OSSs.

WTG and OSS construction could also affect recreation and tourism through visual impacts. During construction, offshore boaters and visitors on the coastline would see the upper portions of tall equipment such as mobile cranes. This equipment would move from turbine to turbine as construction progresses and thus would not be long-term fixtures.

Further, a survey-based study of 1,725 participants who typically visit the coast suggested that (based on visual simulations for prospective offshore wind facilities) only 10% of respondents would experience adverse visual impacts at a distance of 10 miles from shore (Parsons and Firestone 2018). The study suggests that coastal visitors could experience adverse reactions approaching 0% from Project WTGs at approximately 25 to 30 miles offshore. Based on the duration of construction activity and observed distance, visual contrast associated with the Proposed Action would have a temporary **negligible** adverse impact on recreation and tourism. Additionally, construction of offshore Project components could elicit a temporary beneficial impact through an increase in curiosity visits by individuals interested in WTG construction (Parsons and Firestone 2018).

<u>Vessel traffic:</u> Construction would result in as many as 61 construction vessels per construction day in 2023 and 2024 present at offshore work areas (see COP Table 3.3.10-2) on a daily basis. This increase in

vessel volume for the Proposed Action would contribute to increased vessel traffic and associated vessel collision risk along routes between ports and the offshore construction areas if recreational boaters cross or approach cable and WTG locations. However, the majority of recreational boating occurs within 1 nm of shore (Starbuck and Lipsky 2013). Therefore, most recreational boaters in the GAA would experience a temporary, **minor** adverse impact from construction-related vessel traffic.

Onshore Activities and Facilities

Anchoring and new cable emplacement/maintenance: No anchoring impacts would occur as a result of onshore activities. Although onshore construction and installation would occur at the landing site during installation of the cable onshore/offshore transition vaults and during HDD or trenching in preparation for joining the onshore and offshore cables, the landfall work area is developed for non-recreational purposes. The Quonset Point Naval Air Station property is currently the home of the 143rd Airlift Wing of the Rhode Island Air National Guard and is in use as both a military base and a public airport with two active runways. A portion of the base has been converted into a business park. The onshore cable route would follow Circuit Drive and Camp Avenue to the OnSS. No public parks, beaches, or other public recreational facilities are within or immediately adjacent to this onshore route. However, the route travels through the Wickford Historic District, which is primarily a residential community with some commercial buildings that support a seasonal recreation economy. Three potential recreation opportunities—the Wickford Village/Harbor State Scenic Area, the Quonset-Martha's Vineyard Ferries, and Narraganset Bay—are also located in the vicinity. Additionally, as noted above, two public beaches—Blue Beach and Compass Rose Beach—are within 500 to 2,600 feet of the landfall envelope. However, installation of onshore cables would be localized. No direct impacts to public parks, beaches, or other public recreational facilities would occur. Therefore, recreation and tourism impacts during construction would be temporary and **minor** adverse.

Light and Noise: Light and noise from onshore construction activities could temporarily adversely impact the recreation experience of users if present or traveling on roads near the landing site, onshore cable route, and proposed onshore facilities. However, as previously noted, no public parks, beaches, or other public recreational facilities are within or immediately adjacent to this onshore route, OnSS, or ICF. Additionally, the onshore construction schedule would be designed to minimize impacts to the local community during the summer tourist season, generally between Memorial Day and Labor Day. The majority of onshore construction would be completed during daytime hours. Revolution Wind would generally comply with North Kingstown's noise ordinance; however, certain construction tasks such as concrete pours, HDD and landfall installation, and cable pulling or splicing, once started, would be continued through to completion. For nighttime construction work, downward-facing portable floodlights with a maximum height of approximately 18 feet would be used in compliance with all safety and security and local government requirements. Therefore, for most locals and tourists, any adverse impacts would be temporary **minor** impacts, but would not cause a loss to their overall experience.

Presence of structures: A new OnSS and ICF adjacent to the existing Davisville Substation would be constructed to support interconnection of the Project to the existing electrical grid. Vegetation clearing and taller equipment (e.g., cranes) would be visible from certain vantage points during construction of these onshore structures. However, inland residential/commercial areas and recreational sites would generally be screened from construction views due to the presence of existing development combined with forested areas (see COP Appendix U1). Therefore, any adverse impacts to overall recreator experience would be temporary and **minor** adverse impacts, but would not cause a loss to the overall recreator experience.

Vessel traffic: Vehicle and equipment traffic from onshore cable construction activities could temporarily adversely impact the recreation experience of users if present or travelling on roads near the landing site and onshore cable route and facilities. However, as previously noted, no public parks, beaches, or other public recreational facilities are immediately adjacent to the onshore route, OnSS, or ICF. Additionally, Revolution Wind would coordinate with local authorities during onshore construction to minimize local traffic impacts. Therefore, any adverse impacts to tourism or overall recreator experience would be temporary and **minor** adverse.

3.18.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

Anchoring and new cable emplacement/maintenance: During the O&M, a limited number of vessels would be present in the Lease Area or RWEC at any one time. Potential anchoring impacts would be similar to the construction phase, but reduced due to fewer anchored vessels. No cable impacts are anticipated as the RWEC, IAC, and OSS transmission cable typically have no maintenance requirements unless a fault or failure occurs. If cable repair or replacement or remedial cable protection is required, maintenance activities would be limited to the disturbance corridors previously defined for construction. Therefore, O&M and decommissioning impacts would represent a temporary **minor** adverse impact on recreational users. Proposed Action anchoring and cable impacts to fish species used for recreational fishing are addressed in Section 3.9.

Impacts during decommissioning would be similar to the impacts during construction and installation.

Light: During operations, the Proposed Action would contribution to nighttime lighting due to required aviation hazard lighting of up to 102 WTGs and OSSs. The visual impact assessment prepared for Revolution Wind (see COP Appendix U3 [EDR 2021]) determined that the Project would not likely be easily detectable when viewed from a distance of 20 miles or more, and that only 3% of the land area within the visual study area would contain views of the Project. Revolution Wind has also committed to implement ADLS (as described in Appendix F) as a measure to reduce the duration of lighting impacts. As noted in Section 3.20, the Proposed Action's aviation warning lighting, when visible, would add a developed/industrial visual element to views that were previously characterized by dark, open ocean. Due to the limited duration and frequency of such events and the distance of WTGs from shore, however, visible aviation hazard lighting for the Proposed Action would result in a long-term intermittent **negligible** adverse impact on recreation and tourism.

Impacts during decommissioning would be similar to the impacts during construction and installation.

Noise: Noise from O&M (predominately WTG operations) could result in impacts on recreation and tourism. Offshore operational noise from the WTGs would be similar to the noise described for other projects under the No Action Alternative and would thus have long-term **minor** adverse impacts. Impacts during decommissioning would be similar to the impacts during construction and installation.

Presence of structures: During O&M of the Proposed Action, the permanent presence of WTGs would create obstacles for recreational vessels. At their lowest point, WTG blades would be 94 feet above the surface. At this height, larger sailboats would need to navigate around the Lease Area, while smaller vessels could navigate through the Lease Area but would still need to adjust routes to bypass WTGs and OSS foundations. No restrictions on fishing or other recreational pursuits would occur during Project operations. However, some recreational anglers could avoid fishing in the Lease Area due to concerns about their ability to safely fish within or navigate through the area.

For recreational anglers harvesting HMS such as tunas, sharks, and billfish, the spacing of the WTGs could impact access to fishing locations. The fishing methods used and the size, strength, and swimming speed of these larger species require significantly more space for fishing compared to other species; as a result, the proposed separation between WTGs could be insufficient for this type of fishing. Anglers who do fish within the Lease Area would need to change their methods (i.e., they would not be able to allow their boats to drift and would need to correct course to avoid WTGs). See Section 3.9 for analysis on for-hire fishing impacts.

The presence of WTGs would also require the USCG to adjust their search and rescue planning and search patterns to allow aircraft to fly within the GAA, potentially leading to a less-optimized search pattern and a lower probability of success for lost or hurt recreationists (see Section 3.17).

The Proposed Action's WTGs would also affect recreation and tourism through visual impacts. When visible (i.e., on clear days in locations with unobstructed ocean views), WTGs would add a developed/industrial visual element to ocean views that were previously characterized by open ocean, broken only by transient vessels and aircraft passing through the view. However, the visual impact assessment prepared for Revolution Wind (see COP Appendix U3 [EDR 2021]) determined that the Project would not likely be easily detectable when viewed from a distance of 20 miles or more and that only 3% of the land area within the visual study area would contain views of the Project. Revolution Wind has voluntarily committed to use ADLS and non-reflective pure white or light gray paint color, as described in Appendix F to reduce impacts.

The visual contrast created by the WTGs could have a beneficial, adverse, or neutral impact on the quality of the recreation and tourism experience depending on the viewer's orientation, activity, and purpose for visiting the area. As discussed in Section 3.18.1, research suggests that at a distance of 15 miles, few beach visitors (only 6%) would select a different beach based on the presence of offshore wind turbines. An estimated 55 WTGs would fall within this distance, based on the proposed Project array. Considering these factors, BOEM expects the impact of visible WTGs on the use and enjoyment of recreation and tourist facilities and activities during O&M of the Proposed Action Alternative to be long term and **minor** adverse. While some visitors to south-facing coastal or elevated locations could alter their behavior, this changed behavior is unlikely to meaningfully affect the recreation and tourism industry as a whole. Additionally, increased beach visitation by individuals who view the WTGs as positive would offset some lost trips from visitors who consider views of WTGs to be negative (Parsons and Firestone 2018).

Overall, the impacts on most recreational pursuits would be long term but **minor** adverse, while the impact on for-hire fishing would be **moderate** adverse because these enterprises are more likely to be materially affected by displacement, competition for resources, and longer transit times in a manner similar to commercial fishing businesses.

Conversely, charter cruises could also choose to market the operational WTGs as a tourist destination, although their distance from shore could limit some interest. Scour protection around the WTG foundations would likely attract forage fish as well as game fish, which could provide new opportunities for certain recreational anglers. A 1989 survey of recreational fishermen and divers in the Gulf of Mexico found that fishermen were willing to travel up to 45 nm offshore and divers 77 nm offshore to visit abandoned platforms that have been reefed (Stanley and Wilson 1989). A subsequent 2002 study (Hiett and Milon 2002) also found that that there is substantial recreational activity associated with the presence of oil and gas structures in the Gulf of Mexico from Alabama through Texas. These structures range from directly offshore in 10-foot water depths to complex facilities in water depths up to almost 10,000 feet at more than 80 miles from shore (NOAA 2021). The report estimated a total of $324.6 million in economic output in coastal counties of the Gulf region associated with fishing and diving activities near oil and gas structures. A survey of United Kingdom offshore recreational fishermen by Hooper et al. (2017) found that respondents frequently fished at offshore wind farms, with a mean distance from shore of 10 nm. Approximately one quarter of the respondents reported having fished within or around the perimeter of wind farms. Likewise, evidence from Block Island Wind Farm indicates an increase in recreational fishing near the WTGs (Smythe et al. 2018). These surveys suggest that the Project could attract recreational fishing and diving activity, providing a long-term **minor** benefit. The Project could also increase tourism activity during peak tourism months (Carr-Harris and Lang 2019).

Impacts during decommissioning would be similar to the impacts during construction and installation.

<u>Vessel traffic:</u> For regularly scheduled maintenance and inspections, Revolution Wind anticipates that, on average, up to nine crew transfer vessels or service operation vessels would operate in the Lease Area. In other maintenance or repair scenarios, additional vessels could be required. However, this low volume of vessel traffic would not be anticipated to affect ongoing recreational use. O&M of the Proposed Action would therefore have **negligible** adverse impacts on onshore or offshore recreation and tourism.

Impacts during decommissioning would be similar to the impacts during construction and installation.

Onshore Activities and Facilities

<u>Anchoring and new cable emplacement/maintenance:</u> No anchoring impacts would occur as a result of onshore activities. No onshore cable maintenance would be required unless a fault or failure occurs. If cable repair or replacement or remedial cable protection is required, maintenance activities would be limited to the disturbance corridors previously defined for construction. Therefore, O&M and decommissioning impacts would represent a **negligible** adverse impact on recreational users.

<u>Light:</u> Based results of the viewshed analysis (see COP Appendix U1 [EDR 2021]), portions of the lightning masts for OnSS and ICF features could be visible from some views. However, lighting at these facilities would be limited to yard and task lighting for emergency maintenance or repairs. Both categories would be switched lights and only in use if staff are present. Operational lighting for the OnSS and ICF would comply with Quonset Development Corporation lighting regulations and be mounted with the lamp horizontal to the ground (light facing straight down) or with a lamp tilt no more than 25 degrees from the horizon. As such, it is anticipated that the OnSS and ICF would result in **negligible** adverse lighting impacts to the recreation and tourism activities in the GAA. Impacts during decommissioning would be similar to the impacts during construction and installation.

<u>Noise:</u> Operations of onshore Project components (i.e., offshore to onshore transition joint bays, onshore transmission cable route, OnSS, and ICF) would have **negligible** adverse noise impacts intermittently

over the life of the Project to onshore recreation and tourism because these components would only require periodic routine maintenance.

Impacts during decommissioning would be similar to the impacts during construction and installation.

<u>Presence of structures:</u> Based on results of the viewshed analysis (see COP Appendix U1 [EDR 2021]), it is anticipated that the OnSS and ICF could be visible from approximately 15% of the viewshed analysis area. However, the presence of existing landscape vegetation along roadways could further reduce the extent of visual impacts. For more distant views from Wickford Historic District and Wickford Harbor/Wickford Village State Scenic Area, and Narragansett Bay, visibility would only include the upper portions of a few proposed transmission structures. However, where visible at foreground distances, the proposed OnSS and ICF could introduce new industrial/utility structures into the landscape. Nevertheless, the proposed OnSS and ICF would not be out of scale or character with the existing types of development currently present in the vicinity, such as the existing Davisville Substation or the structures at nearby Quonset Business Park. As such, it is anticipated that the OnSS and ICF would result in **negligible** adverse visual impacts to recreation and tourism activities in the GAA.

Impacts during decommissioning would be similar to the impacts during construction and installation.

<u>Vessel traffic:</u> Potential traffic impacts would be similar to the construction phase but likely reduced due to fewer equipment and vehicle trips. Impacts during decommissioning would be similar to the impacts during construction and installation: temporary and **minor** adverse.

3.18.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

<u>Anchoring and new cable emplacement/maintenance:</u> Up to approximately 5,338 acres of anchoring and 14,157 acres of cabling seafloor disturbance could occur from ongoing and planned actions, including the Proposed Action, in the recreation and tourism GAA. Project-related construction anchorages would noticeably add to disturbances of marine species and their habitats important to recreational fishing and could require recreational and tourism vessels to navigate around moving and anchored construction-related vessels while in transit. The buried cabling would also present short-term navigational hazards. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** adverse cumulative impacts on recreation and tourism.

<u>Light:</u> New lighting from the Proposed Action would contribute to a 11% increase in in-water lighting sources from past, present, and reasonably foreseeable future projects within the GAA by introducing built visual elements to views previously characterized by dark, open ocean. Collectively, 9% of the WTG positions envisioned in the GAA would be less than 15 miles from coastal locations with views of the WTGs.

Given the distance from recreational viewers and atmospheric interference, lighting from the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in long-term intermittent **minor** adverse cumulative impacts on recreation and tourism.

<u>Noise:</u>. Noise from construction could lead to the displacement of fish in and around construction sites, leading to spatial competition, depending on migrating patterns. Recreational boaters and tourists would not be permitted to approach active construction zones and would therefore not be expected to experience

noise impacts from offshore construction. Because of the distance from receptors, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in localized short-term **minor** to **moderate** adverse cumulative impacts on recreation and tourism due to construction activities, whereas noise from O&M activities would result in long-term **negligible** adverse cumulative impacts.

<u>Presence of structures:</u> The Proposed Action would noticeably add up to 102 foundations to the 953 foundations estimated for the No Action Alternative within the GAA. New structures related to the Proposed Action would add to the long-term impacts on recreation and tourism throughout the life of the Project (up to 35 years, plus up to an additional 2 years for decommissioning) by increasing navigational complexity; risks of structure allision; route adjustments for races, sightseeing, and fishing; loss and damage of fishing gear to scour and cable protection; and difficulty anchoring over scour and cable protection. However, new in-water structures from the Proposed Action could benefit recreation and tourism by attracting recreational vessels to WTGs for fishing and sightseeing activities. Therefore, new in-water structures from the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** to **moderate** adverse and long-term **minor** beneficial cumulative impacts on recreation and tourism.

Construction and O&M of the Project would also noticeably increase the visual impacts on recreational and tourism users by adding up to 100 WTGs and two OSSs to the No Action Alternative. Based on visual simulations described in Sections 3.18.1.1, 3.18.2.2.1, and 3.18.2.2.2, the visibility of large offshore structures is not expected to impact shore-based recreation and tourism as a whole. Cumulative visual impacts on recreation and tourism resulting from the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would be short term and **minor** adverse for onshore viewers at sensitive viewing locations because of the distance and natural atmospheric interference. Cumulative visual impacts on recreation and tourism resulting from the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would be short term **minor** to **moderate** adverse for offshore recreational users and would increase as users approach the WTGs. Impacts to viewers at sensitive viewing locations are addressed in Section 3.20.

<u>Vessel traffic:</u> Project vessels would noticeably add to disturbances of marine species and their habitats important to recreational fishing and could require recreational and tourism vessels to navigate around moving construction-related vessels while in transit. However, non-Project traffic would be able to adjust routes and avoid the work area and transiting construction vessels. BOEM estimates a peak of 276 vessels at sea on a daily basis due to offshore wind project construction and O&M over a 10-year time frame, with most of these vessels remaining in the vicinity of their respective lease areas. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable activities would result in short-term and long-term **minor** adverse cumulative impacts on recreation and tourism.

Onshore Activities and Facilities

<u>Anchoring and new cable emplacement/maintenance:</u> No anchoring impacts would occur as a result of onshore activities. No onshore cable maintenance would be required unless a fault or failure occurs. If cable repair or replacement or remedial cable protection is required, maintenance activities would be limited to the disturbance corridors previously defined for construction. Therefore, the Proposed Action

when combined with past, present, and reasonably foreseeable projects would result in temporary **negligible** adverse cumulative impacts to onshore recreation and tourism.

<u>Light:</u> Construction associated with the Proposed Action could add temporary minor adverse light impacts experienced by onshore recreational users near the landfall work area, onshore transmission cable route, or onshore facilities or from the aviation hazard lighting on the new WTGs. Long-term increases in operational lighting from the Proposed Action would be **negligible** adverse. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in temporary **minor** adverse cumulative impacts to onshore recreation and tourism.

<u>Noise:</u> As with lighting, construction activities would add noise from the construction of onshore facilities to the ambient noise levels of the No Action Alternative. Onshore construction noise would be localized to the source, short term **minor** to **moderate** adverse, depending on the distance of the receptor from the source. Long-term increases in operational noise from the Proposed Action would be **negligible** adverse. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in temporary **minor** adverse cumulative impacts to onshore recreation and tourism.

<u>Presence of structures:</u> Onshore construction and installation would add an O&M facility, an interconnection facility, and an OnSS to the No Action Alternative. These new onshore structures would only result in **minor** adverse visual impacts experienced by recreational users due to the existing settings at these locations (see Section 3.20 for details on potential visual impacts). When considered cumulatively with past, present, and reasonably foreseeable activities, the Proposed Action would result in temporary **negligible** to **minor** adverse cumulative visual impacts on recreation and tourism.

<u>Vessel traffic:</u> Construction vehicles associated with the Proposed Action could add traffic delays experienced by recreational travelers on local roadways. Long-term increases in operational traffic from the Proposed Action would be **negligible** adverse. Therefore, the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in temporary **minor** adverse cumulative impacts to onshore recreation and tourism.

3.18.2.2.4 Conclusions

Project construction and installation and decommissioning would introduce noise, lighting, human activity, vehicles and vessels (increasing potential collision risk), and interruption to access points in the GAA. Noise, lighting, and human activity impacts from Project O&M would occur, although at lower levels than those produced during construction and decommissioning. BOEM anticipates that the impacts resulting from the Proposed Action alone would range from **negligible** to **minor** adverse and short term to long term. Project activities are expected to contribute to several IPFs, the most prominent being noise and vessel traffic during construction and the presence of offshore structures during operations. Noise and vessel traffic would have impacts on visitors, who may avoid onshore and offshore noise sources and vessels, and impacts on recreational fishing and sightseeing as a result of the impacts on fish, invertebrates, and marine mammals. BOEM expects the overall impact on recreation and tourism from the Proposed Action alone to be **minor** adverse; however, the overall effect would be small, and recreation and tourism would be expected to recover completely without remedial or mitigating action.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from **negligible** to **moderate** adverse and **minor** beneficial. Impacts would result from short-term impacts during construction: noise, anchored vessels, and hindrances to navigation; and the long-term presence of cable hard cover and structures in the GAA during operations, with resulting impacts on recreational vessel navigation and visual quality. Beneficial impacts would result from the reef effect and sightseeing attraction of offshore wind energy structures. 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 impacts and **minor** beneficial impacts to recreation and tourism. The overall effect would be small, and recreation and tourism would be expected to recover completely with no mitigating action required.

3.18.2.3 Alternatives C, D, E, and F

Table 3.18-2 provides a summary of IPF findings for these alternatives.

3.18.2.3.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and associated IACs, the presence of WTGs could still increase congestion, space conflicts, navigation risks, and the potential for collision, albeit at lower levels than the Proposed Action. The reduced number of WTGs under these alternatives could provide a long-term beneficial impact for some recreational viewers. Therefore, BOEM expects that the impacts resulting from each alternative alone would range from **negligible** to **moderate** adverse.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that each alternative's impacts would be similar to the Proposed Action (with individual IPFs leading to impacts ranging from **negligible** to **moderate** adverse and **minor** beneficial). The overall impacts of each alternative when combined with past, present, and reasonably foreseeable activities would therefore be the same as those under the Proposed Action: **minor** adverse and **minor** beneficial.

3.18.2.4 Mitigation

If BOEM requires potential additional mitigation measures identified in Table F-2 of Appendix F, such as developing a navigation safety plan and developing a construction schedule that minimizes overlap with recreational fishing tournaments and other important seasonal recreational fishing events, minor and short-term adverse impacts for local residents who recreate offshore would be further reduced.

3.19 Sea Turtles

3.19.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Sea Turtles

Geographic analysis area: The sea turtles GAA is described in Appendix G and illustrated in Figure 3.19-1. The intent of the GAAs used in this EIS is to define a reasonable boundary for assessing the potential effects, including cumulative effects, resulting from the development of an offshore wind energy industry on the mid-Atlantic OCS. GAAs for marine biological resources are necessarily large because marine populations range broadly and cumulative impacts can be expressed over broad areas. GAAs are not used as a basis for analyzing the effects of the Proposed Action, which represent a subset of these broader effects and expressed over a smaller area. These impacts are analyzed specific to each IPF. The GAA for sea turtles comprises the Northeast Shelf and Southeast Shelf Large Marine Ecosystems, as shown in Figure 3.19-1. This broad area captures the typical movement range within U.S. waters of most sea turtles that could occur within the Project vicinity during the construction and installation, O&M, and decommissioning of the Project. Thus, while Project-related impacts to sea turtle habitat are restricted to a relatively small GAA, the GAA for Project impacts to sea turtles is necessarily large due to their movement range.

Affected environment: Four species of sea turtles are known to occur in or near the proposed RWF and RWEC, and all are protected species under the ESA. These are the green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), and Kemp's ridley sea turtle (*Lepidochelys kempii*). The potential impacts of the Proposed Action to these species are assessed in Section 3.19.2. The hawksbill sea turtle (*Eretmochelys imbricata*) is also protected under the ESA but is exceedingly rare in the Project vicinity (Kenney and Vigness-Raposa 2010) (see Figure 3.19-1). The proposed RWF and RWEC is considered outside the normal range of hawksbill turtles, which range predominantly in warmer waters to the south. Individual hawksbill turtles have occasionally occurred in and near the southern New England area after being stunned by exposure to unusual cold-water events and subsequently transported northward by the Gulf Stream into the region. These occurrences are not representative of normal behaviors or distribution. Similarly, while this species does occur in the GAA for sea turtles (defined in Appendix E), the Proposed Action is unlikely to contribute to any measurable cumulative effects, and hawksbill sea turtles are therefore not considered further in this EIS.

Sea turtles primarily inhabit tropical and subtropical seas throughout the world, with several species seasonally ranging into temperate zones to forage. Sea turtles are morphologically adapted for continuous swimming, and they can remain underwater for extended periods, ranging from several minutes to several hours, depending on factors such as daily and seasonal environmental conditions and specific behavioral activities associated with dive types (Hochscheid 2014; National Science Foundation [NSF] and USGS 2011). These adaptations are important because sea turtles often travel long distances between their feeding grounds and nesting beaches (Meylan 1995). There are no nesting beaches or other designated critical habitats in the vicinity of the RWF (Greater Atlantic Regional Fisheries Office [GARFO] 2020), meaning that individuals occurring in the proposed RWF and RWEC are either migrating or foraging. As such, these individuals likely spend the majority of time below the surface, although specifics are species dependent. Underwater observations of 73 sea turtles with 2,742 minutes of video in the mid-Atlantic found that loggerhead sea turtles were within the near-surface region of the water column a median of 42% of the time (Patel et al. 2016).

The combination of sightings, strandings, tag, and bycatch data provides the best available information on sea turtle distribution. This section summarizes data from sightings and surveys of the waters around the Lease Area (Kraus et al. 2016), the NMFS Sea Turtle Stranding and Salvage Network (STSSN) (NMFS STSSN 2020), recent available density estimates (Denes et al. 2020a), and historic regional data (Kenney and Vigness-Raposa 2010). Denes et al. (2020a) compiled estimated seasonal densities for Kemp’s ridley, leatherback, and loggerhead sea turtles in the GAA using data obtained from U.S. Navy Operating Area Density Estimates and Ocean Biodiversity Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) databases (Halpin et al. 2009; Navy 2007, 2012). Green sea turtle densities were not estimated because suitable data for the region are limited. Table 3.19-1 summarizes potential sea turtle occurrence in the southern New England coastal waters off Rhode Island and Massachusetts. Potential effects to sea turtles, which are discussed in Section 3.19.2, are based on the likelihood of occurrence.

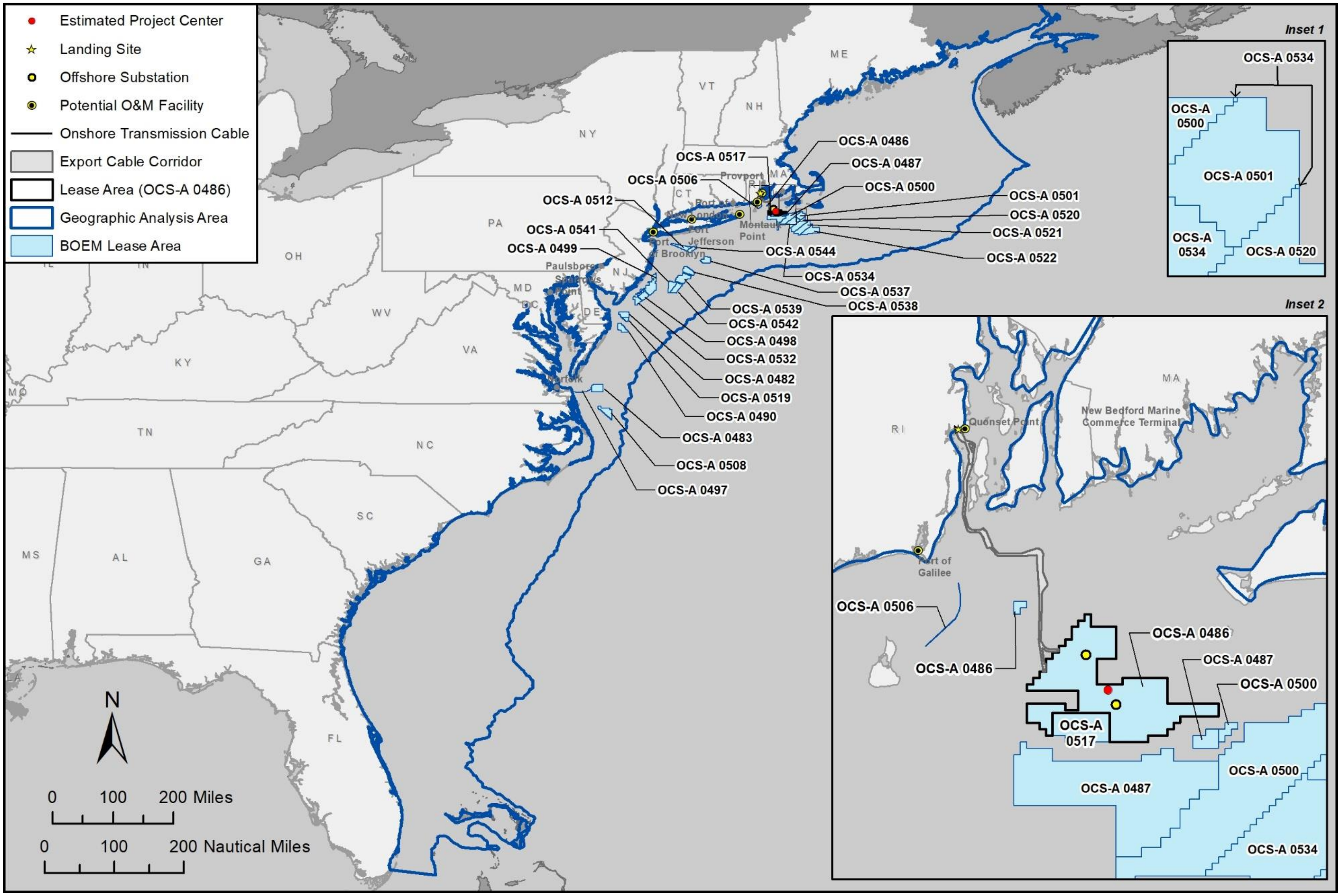

Figure 3.19-1. Geographic analysis area for sea turtles.

Table 3.19-1. Frequency of Sea Turtle Species Occurrence in the Revolution Wind Farm and Revolution Wind Export Cable

Common Name	Scientific Name	Distinct Population Segment*/Population	Endangered Species Act Status*	Frequency of Occurrence[†, ¶]	Seasonal Occurrence[‡,§]	Likelihood of Occurrence[§,¶]	Included in Impact Analysis?
Green sea turtle	*Chelonia mydas*	North Atlantic	T	Uncommon, limits of range	May to November	Unlikely/ uncommon	Yes
Hawksbill sea turtle	*Eretmochelys imbricata*	Throughout range	E	Rare, outside range	May to November	Exceedingly unlikely	No, outside limits of range
Leatherback sea turtle	*Dermochelys coriacea*	Atlantic[±±]	E	Common	May to November	Likely	Yes
Loggerhead sea turtle	*Caretta caretta*	Northwest Atlantic	T	Common	May to November	Likely	Yes
Kemp's ridley sea turtle	*Lepidochelys kempii*	Throughout range	E	Regular	May to November	Likely but infrequent	Yes

Notes: Data from NMFS STSSN (2020).

* DPS = distinct population segment, E = endangered, T = threatened.

[†] Data from Kenney and Vigness-Raposa (2010). Common = fewer than 100 observations, regular = 10–100 observations; rare = fewer than 10 observations.

[‡] Data from GARFO (2020).

[§] Data from NEFSC and SEFSC (2018).

[¶] Based on observations by Kraus et al. (2013, 2014, 2016), O'Brien et al. (2020, 2021a, 2021b), and Quintana et al. (2019).

[±±] A Northwest Atlantic DPS to be listed as threatened has been proposed for leatherback sea turtles (85 *FR* 48332). The Atlantic population considered herein includes this proposed DPS.

Green sea turtle: Green sea turtles are found in tropical and subtropical waters around the globe. They are most commonly observed feeding in the shallow waters of reefs, bays, inlets, lagoons, and shoals that are abundant in algae or marine grass (NMFS and USFWS 2007). In U.S. waters, they are typically found in the Gulf of Mexico or coastal waters south of Virginia (USFWS 2021). Juveniles and subadults are occasionally observed in Atlantic coastal waters as far north as Massachusetts (NMFS and USFWS 1991), including the waters of Long Island Sound and Cape Cod Bay (Cetacean and Turtle Assessment Program 1982). The species' primary nesting beaches are located in Costa Rica, Mexico, the United States (Florida), and Cuba. According to Seminoff et al. (2015), nesting trends are generally increasing for this population. Based on feeding and habitat preferences, the species is less likely to occur in the RI/MA WEA and MA WEA. Kenney and Vigness-Raposa (2010) recorded one confirmed sighting within the RI/MA WEA in 2005. The STSSN reported one offshore and 20 inshore green sea turtle strandings between 2017 and 2019, and green sea turtles are found each year stranded on Cape Cod beaches (NMFS STSSN 2020; Wellfleet Bay Wildlife Sanctuary [WBWS] 2018). Five green turtle sightings were recorded off the Long Island shoreline 10 to 30 miles southwest of the RI/MA WEA in aerial surveys conducted from 2010 to 2013 (NEFSC and SEFSC 2018), but none were positively identified in multiseason aerial surveys of the RI/MA WEA from October 2011 to June 2015 (Kraus et al. 2016). Because of the limited number of sightings, uncertainty regarding survey method effectiveness, and difficulties observing juveniles, it is not possible to develop precise occurrence probability or density estimates for this species, but occurrence in the RWF and RWEC is expected to be uncommon and limited to small numbers.

Leatherback sea turtle: The leatherback 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 they are commonly observed in coastal waters along the OCS (NMFS and USFWS 1992). The breeding population estimate (total number of adults) in the North Atlantic is 34,000 to 95,000, and, aside from the western Caribbean, nesting trends at all other Atlantic nesting sites are generally stable or increasing (NMFS and USFWS 2013; Turtle Expert Working Group 2007). Atlantic Marine Assessment Program for Protected Species surveys conducted from 2010 through 2013 routinely documented leatherbacks in New England waters, including the RI/MA WEA, during the summer months (NEFSC and SEFSC 2018). Kraus et al. (2016) recorded 153 observations in monthly aerial surveys, all between May and November, with a strong peak in August. Monthly aerial surveys on the New York Bight from 2017 through 2020 documented a total of 37 leatherback sea turtles, with an additional 503 unidentified sea turtles observed (Tetra Tech and LGL Ecological Research Associates, Inc. 2020). During the summer (June–August) and fall (September–November) months; leatherback density within the RI/MA WEA (refer to Figure 1.1-2) was estimated to be 0.0063 animals per km^2 and 0.0087 animals per km^2, respectively, compared to densities of effectively zero for the rest of the year (Kusel et al. 2021). The STSSN reported 19 offshore and 77 inshore leatherback sea turtle strandings between 2017 and 2019, the highest number among all turtle species reported (NMFS STSSN 2020). Kraus et al. (2016) data indicated that leatherbacks would be the most abundant sea turtle species in the RWF and RWEC, which is consistent with the other information on sea turtle occurrence in the vicinity presented here. Based on this information, leatherback sea turtles are expected to occur commonly in the RWF and RWEC between May and November, with the highest probability of occurrence from July through October (Sherrill-Mix et al. 2008).

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). Regional abundance on the northwest Atlantic, corrected for unidentified turtles in proportion to the ratio of identified turtles, estimates about 801,000 loggerheads (NEFSC and SEFSC 2011). The three largest nesting subpopulations responsible for most of the production in the western North Atlantic (peninsular Florida, northern United States, and Quintana Roo, Mexico) have all been declining since at least the late 1990s, thus indicating a downward trend for this population (Turtle Expert Working Group 2009). 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). Atlantic Marine Assessment Program for Protected Species surveys reported loggerhead sea turtles as the most commonly sighted sea turtles on the shelf waters from New Jersey to Nova Scotia, Canada. During the December 2014 to March 2015 aerial abundance surveys, 280 individuals were recorded (Palka et al. 2017). Large concentrations were regularly observed south and east of Long Island near the RI/MA WEA (NEFSC and SEFSC 2018). Kraus et al. (2016) observed loggerhead sea turtles within the RI/MA WEA in the spring, summer, and fall, with the greatest density of observations in August through September. Kusel et al. (2021) estimated the density of loggerhead sea turtles within the RI/MA WEA to be 0.00755 animals per km^2 at peak occurrence during the fall months, 0.00206 animals per km^2 during the summer months, and 0.00084 animals per km^2 for the rest of the year. The STSSN reported six offshore and 58 inshore loggerhead sea turtle strandings between 2017 and 2019 (NMFS STSSN 2020). In New York State waters, the New York Marine Rescue Center (NYMRC) documented 816 strandings of loggerhead sea turtles from 1980 to 2018 (NYMRC 2021). Winton et al. (2018) estimated densities using data from 271 satellite tags deployed on loggerhead sea turtles between 2004 and 2016 and found that tagged loggerheads primarily occupied the OCS from Long Island, New York, south to Florida, but relative densities in the RI/MA WEA increased during the period between July and September. Collectively, available information indicates that loggerhead sea turtles are expected to occur commonly in the RWF and RWEC 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 are most commonly found in the Gulf of Mexico and along the U.S. Atlantic coast. The species is primarily associated with habitats on the OCS, with preferred habitats consisting of sheltered areas along the coastline, including estuaries, lagoons, and bays (Burke et al. 1994; NMFS 2019), and nearshore waters less than 120 feet (37 m) deep (Seney and Landry 2008; Shaver et al. 2005; Shaver and Rubio 2008), although they can also be found in deeper offshore waters. Kemp's ridley sea turtle nesting is largely limited to the beaches of the western Gulf of Mexico, primarily in Tamaulipas, Mexico. Nesting also occurs in Veracruz, and a few historical records exist for Campeche, Mexico. In the United States, nesting occurs primarily in Texas and occasionally in Florida, Alabama, Georgia, South Carolina, and North Carolina (NMFS and USFWS 2015). Nesting outside of Gulf of Mexico states is rare but has been observed as far north as New York State (NPS 2018). Recent data show that the total number of recorded nests from all beaches in Mexico peaked in 2012 at 22,458 but declined to 12,060 in 2014, the last year for available data (NMFS and USFWS 2015). Juvenile and subadult Kemp's ridley sea turtles are known to travel as far north as Cape Cod Bay during summer foraging (NMFS et al. 2011). Visual sighting data are limited because this small species is difficult to observe using typical aerial survey methods (Kraus et al. 2016). In all, five observations were recorded in the RI/MA WEA during 4 years of aerial surveys, all in August and September 2012 (Kraus et al. 2016). The species has been sighted near the proposed RWF in other survey efforts, mostly to the south and west of the RI/MA WEA (Right Whale Consortium 2019).

Kusel et al. (2021) conservatively estimate the density of Kemp's ridley sea turtles within the RI/MA WEA to be 0.00006 animals per km^2 throughout the year for exposure modeling purposes. However, this estimate does not accurately reflect seasonality of occurrence. Like all sea turtle species occurring in the region, the Kemp's ridley sea turtle is most commonly observed from late spring through early fall when suitable water temperatures are present, with occurrences later in the year limited to individuals that have been cold stunned and are outside their normal seasonal range. The STSSN reported six offshore and 69 inshore Kemp's ridley sea turtle strandings between 2017 and 2019 (NMFS STSSN 2020), and the NYMRC has documented the stranding of 620 Kemp's ridley sea turtles within New York State waters between 1980 and 2018 (NYMRC 2021). Cold-stunned Kemp's ridley sea turtles are often found stranded on the beaches of Cape Cod (Lui et al. 2019; WBWS 2019). Based on this information, Kemp's ridley sea turtles could occur infrequently as juveniles and subadults from July through September. The highest likelihood of occurrence within the Project limits is along the RWEC corridor in the protected waters of Narragansett Bay. Occurrence in the RWF is possible the likelihood of occurrence is difficult to assess from available data because this species is difficult to detect in visual surveys (Kraus et al. 2016). On this basis, Kemp's ridley sea turtles could occur in the RWF and RWEC in low numbers on an annual basis throughout the life of the Project.

3.19.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential sea turtle impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E2.

Offshore Activities and Facilities

<u>Accidental releases and discharges:</u> BOEM prohibits the discharge or disposal of solid debris into offshore waters during any activity associated with the construction and operation of offshore renewable energy facilities (30 CFR 585.105(a)). The USCG similarly prohibits the dumping of trash or debris capable of posing entanglement or ingestion risk (MARPOL, Annex V, Public Law 100−220 (101 Stat. 1458)). BOEM also requires applicants to develop spill response and containment plans to quickly address accidental spills of fuels, lubricants, and other contaminants. While marine vessels are an inherent source of accidental releases of trash, debris, and contaminants, these requirements would effectively avoid and minimize these impacts such that the resulting effects to sea turtles would be **negligible** adverse.

Trash or water quality contaminants could be accidentally released as a result of increased human activity associated with future offshore wind construction activities. 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 (Schyuler et al. 2014). Ingesting trash or exposure to aquatic contaminants can be lethal to sea turtles. However, turtles may also 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). 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 1991, 1992; NMFS et al. 2011). Based on a recent global review, 5.5% of encountered sea turtles were found to be entangled, and 90.6% of these were dead (Duncan et al. 2017). Lost or discarded fishing gear was associated with most of these entanglements, and many experts believed that these impacts could be causing population-level impacts in some areas. Aquatic contaminant exposure could also 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). Furthermore, accidental releases could 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 would avoid and minimize accidental releases of trash or other debris. Therefore, potential accidental releases of trash or debris would not appreciably contribute to adverse impacts to sea turtles and would be **negligible** adverse.

Impacts to sea turtles from accidental spills and releases associated with ongoing future non–offshore wind activities are likely to increase over the next 30 years commensurate with increases in vessel traffic. Future offshore wind activities would contribute to this increased risk. A total of approximately 18 million gallons of coolants, fuels, oils, and lubricants could be stored within WTG foundations and OSSs across all projected offshore wind projects along the Atlantic coast. A high-volume spill of toxic materials (fuels, lubricants, and other contaminants) could potentially injure or kill several individual sea turtles and adversely affect habitat suitability. Given that the affected habitats would be at or outside the northern limit of range of most species, the number of individuals impacted would be small relative to population size. In the unlikely event of a high-volume spill, impacts of this magnitude would constitute a moderate effect on sea turtles. BOEM anticipates that the likelihood of a major spill of petroleum products and other toxic substances during construction is very low (a 1 in 1,000 chance per year) due to vessel allisions, collisions, O&M activities, or weather events (Bejarano et al. 2013). WTGs and OSSs are generally self-contained and would not generate discharge. All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and the BSEE Oil spill response plans are required for each project and would provide for rapid spill response, clean-up, and other measures that would help to minimize potential impacts on affected resources. Given the low probability of a large spill event, impacts to sea turtles from this IPF are likely to be **negligible** adverse.

Climate change: 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. This is particularly true when considering how the effects of climate change may interact with other IPFs. Possible impacts to sea turtles due to climate change include increased storm severity and frequency; changes in nearshore habitat suitability caused by increased erosion from upland sources; exposure to disease; ocean acidification; and altered habitat, prey availability, ecology, and migration patterns (Hawkes et al. 2009).

However, some of these potential impacts could also contribute to potential benefits associated with the creation of artificial reef habitat and could represent an increasing impact over the life of the Project. The potential implications of these and other related environmental changes and how they interact with the effects of regional offshore wind development are complex and uncertain. For example, the distribution of leatherback sea turtles in the North Atlantic is shifting northward in response to changes in water temperature (McMahon and Hays 2006). Should this trend continue it could lead to increased interactions between this species and offshore wind farms on the mid-Atlantic OCS, 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. As described in Section 3.19.1, sea turtle populations likely to be impacted by the Project are stable or generally increasing from historic lows. Therefore, potential climate change impacts would be **minor** adverse.

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; military sonar; geophysical surveys; and the development and operation of other wind energy projects on the OCS. Several wind energy projects could be developed between 2022 to 2030, and their construction periods could overlap, adding several new sources of underwater noise to baseline levels generated by vessel traffic. As discussed in Section 2.1.3, some projects could be constructed concurrently or could involve concurrent construction activities (e.g., impact pile driving) at two or more locations in proximity, creating the potential for larger and/or overlapping areas of underwater noise effects.

Existing and potential future anthropogenic noise sources generally fall into two categories: 1) impulsive noise, defined as the instantaneous change in sound pressure over a short period of time; and 2) non-impulsive noise, which could be intermittent or remain constant and stable over a given time period. Impulsive and non-impulsive noise sources associated with offshore wind projects are discussed in the sections below.

Impulsive noise: Existing and potential future sources of impulsive underwater noise in the GAA include impact pile driving used in nearshore and offshore construction activities and geological and geophysical surveys.

Sea turtles could experience any of the following three potential exposure scenarios under the No Action Alternative:

1. Concurrent exposure to noise from two or more impact hammers, operating within the same project or in adjacent projects
2. Non-concurrent exposure to noise from multiple pile-driving events within the same year
3. Exposure to two or more concurrent or non-concurrent pile-driving events over multiple years

The reader is referred to Section 3.15 for a discussion of these concurrent noise exposure scenarios.

Geological and geophysical surveys generate high-intensity impulsive sound with the potential to result in short-term and long-term impacts on sea turtles if they are present in the ensonified area. Offshore wind surveys typically involve HRG equipment, which can generate non-impulsive noise that is generally less intense than noise generated from other geological and geophysical survey methods. Potential impacts from HRG equipment include sub-bottom profilers (e.g., boomer and sparker categories of equipment) that could be audible to sea turtles.

None of the equipment being operated for these surveys that overlaps with the hearing range (30 Hz to 2 kHz) for sea turtles 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 could exhibit a behavioral response when exposed to received levels of 175 dB re 1 µPa (rms), and some HRG is within their hearing range (below 2 kHz). For boomers and bubble guns, the distance to this threshold is 40 m, and is 90 m for sparkers. Thus, a sea turtle would need to be within 90 m of the source to be exposed to potentially disturbing levels of noise. We expect that sea turtles would react to this exposure by swimming away from the sound source; this would limit exposure to a short time period—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 for at least 30 minutes. This condition is expected to reduce the potential for sea turtles nearby to be exposed to noise that could be disturbing. However, even in the event that a sea turtle is submerged and not seen by the PSO, in the worst case, it is expected that sea turtles would avoid the area ensonified by the survey equipment that they can perceive. Because the area where increased underwater noise would be experienced is transient and increased underwater noise would only be experienced in a particular area for only seconds, BOEM expects any effects to behavior to be minor and limited to a temporary disruption of normal behaviors, temporary avoidance of the ensonified area, and minor additional energy expenditure spent while swimming away from the noisy area. If foraging or migrations are disrupted, BOEM expects that they would quickly resume once the survey vessel has left 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 would be temporary (seconds to minutes) and localized (avoiding an area no larger than 90 m), and there would be only a minor and temporary impact on foraging, migrating, or resting sea turtles as the vessel continues along a survey line. Effects to individual sea turtles from brief exposure to potentially disturbing levels of noise are expected to be minor and limited to a brief startle, a short increase in swimming speed, and/or short displacement and would be so small that they cannot be meaningfully measured, detected, or evaluated; therefore, effects are negligible.

BOEM has concluded that disturbance of sea turtles from underwater noise generated by site characterization and site assessment activities would likely result in temporary displacement and other behavioral or nonbiologically significant physiological consequences (i.e., no injury or mortality would occur), and impacts on sea turtles would be negligible adverse.

Impulsive underwater noise from impact pile driving during planned offshore wind development, due to the anticipated frequency and spatial extent of effects, represents the highest likelihood for exposure of individual sea turtles to adverse impacts from noise. Although these potential impacts are acknowledged, their potential extent and magnitude is unclear because sea turtle sensitivity and behavioral responses to underwater noise are a subject of ongoing study. Potential behavioral impacts could include altered submergence patterns, temporary disturbance, startle response (diving or swimming away), and temporary 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 (Navy 2018). Conversely, sea turtles could become habituated to repeated noise exposure over time and not suffer any long-term consequences (O'Hara and Wilcox 1990; Hazel et al. 2007). This type of noise habituation has been demonstrated even when the repeated exposures were separated by several days (Bartol and Bartol 2011; Navy 2018).

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). Impacts to sea turtles from construction-related noise would likely be limited to minor or moderate short-term impacts on a small number of individuals. These short-term impacts on individuals are not expected to result in population-level effects; the effects of impulsive noise on sea turtles would therefore be **minor** adverse overall.

Non-impulsive noise: Non-impulsive underwater noise sources in the GAA include baseline noise levels from activities not regulated by BOEM, such as 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 would constitute a low-level, non-impulsive underwater noise source throughout the life of a given project.

Helicopters and fixed-wing aircraft could 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. Bevan et al. (2018) observed no evident behavioral responses from sea turtles exposed to drones flown directly overhead at altitudes ranging from 60 to 100 feet. Helicopters and aircraft would operate at altitudes of 1,000 feet or more except when helicopters are landing or departing from service vessels. In development of American National Standards Institute (ANSI) guidelines for fishes and sea turtles, Popper et al. (2014) did not consider aircraft noise because it was not considered to pose a great risk. Based on this information, cumulative effects on sea turtles from aircraft used for wind energy development on the OCS would be expected to be negligible.

Vibratory pile driving used during submarine cable construction is the most intensive source of intermittent, non-impulsive underwater noise expected to result from planned offshore wind energy development. Vibratory pile-driving noise can exceed levels associated with behavioral disturbance in sea turtles but only within a short distance (i.e., less than 200 feet) from the source. Given this low exposure probability to vibratory pile-driving noise and the fact that vibratory pile-driving activities would be limited in extent, temporary in duration, and widely separated, vibratory pile-driving noise effects on sea turtles would be negligible adverse.

Construction and operational vessels are the most broadly distributed source of intermittent non-impulsive noise associated with offshore wind projects. Sea turtle exposure to underwater vessel noise would correspondingly increase as a result of planned offshore wind projects, especially during construction periods. Applying vessel activity estimates developed by BOEM 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 2019b), vessel activity could peak in 2025, with as many as 276 vessels involved in the construction of reasonably foreseeable projects (see Section 2.1.3 for details). However, this increase must be considered relative to the baseline level of vessel traffic. The relatively low frequency range of turtle hearing (100–1,200 Hz) (Ketten and 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 temporary stress response (NSF and USGS 2011). Overall, impacts to sea turtles from vessel noise would be negligible. 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. Nonetheless, periodic localized, intermittent, and temporary behavioral impacts on sea turtles could occur. 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. 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 future activities on sea turtles would be negligible adverse.

Tougaard et al. (2020) summarized available monitoring data on wind farm operational noise, including both older generation geared turbine designs and quieter modern direct-drive systems like those proposed for the RWF. They determined that operating turbines produce underwater noise on the order of 110 to 125 dB_{RMS}, occasionally reaching as high as 128 dB_{RMS}, in the 10-Hz to 8-kHz range. This is consistent with the noise levels observed at the BIWF (110 to 125 dB re 1 µPa SPL rms) (Elliot et al. 2019) and the range of values observed at European wind farms and is therefore representative of the range of operational noise levels likely to occur from future wind energy projects. Sea turtle hearing is largely within the frequency range (< 1,200 Hz) for operational wind turbines; therefore, it is possible that wind turbine noise could be heard by sea turtles, although behavioral responses are unlikely based on the established threshold (175 dB_{RMS} re 1 µPa). This indicates that operational noise effects from other future actions would likely be negligible adverse.

Overall, effects of non-impulsive noise on sea turtles would be **negligible** adverse because of the patchy distribution of sea turtles and limited likelihood of behavioral responses to expected noise levels.

<u>Presence of structures:</u> The addition of up to 3,008 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). The artificial reefs created by these structures form biological hotspots that could support species range shifts and expansions and changes in biological community structure (Degraer et al. 2020; Methratta and Dardick 2019; Raoux et al. 2017). Section 3.13 discusses reef creation and altered water flow in detail. The significance of these ecological changes to sea turtles is unknown, but the biological productivity generated by reef effects could result in improved foraging opportunities for some species at project scales. For example, loggerhead turtles may benefit from the increased abundance of crustaceans and other prey species concentrated around offshore structures. On this basis, the presence of structures could produce permanent **minor** beneficial effects on sea turtles that would persist over the life of the Project.

In contrast, broadscale hydrodynamic impacts could alter zooplankton distribution and abundance (van Berkel et al. 2020). There is considerable uncertainty as to how these broader ecological changes would affect sea turtles in the future and how those changes will interact with other human-caused impacts. The effect of reef effects and hydrodynamic impacts on sea turtles and their habitats under the No Action Alternative could be adverse or beneficial, varying by species, and their extent and magnitude is unknown.

The presence of structures could also concentrate recreational and commercial 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 2021a). Due to the high number of foundations in a given lease area, 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 from recreational and for-hire fishing since both fishers and turtles may be attracted to the same areas.

If structures result in vessel displacement or gear shifts, the potential impact to sea turtles is uncertain. Increased risk would not be expected by vessel displacement due to the patchy distribution of sea turtles. However, it could result in a potential increase in the number of vertical lines in the water column if there is no commensurate reduction in fixed-gear types as compared to mobile gear. In such circumstances of a greater shift from mobile gear to fixed gear, there would be a potential increase in the number of vertical lines, resulting in an increased risk of sea turtle interactions with fishing gear. Therefore, associated effects of structures on sea turtles through potential reef effects, hydrodynamic impacts, and concentration of fishing would be **minor** adverse.

Vessel 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% in the 1980s to 20.5% 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 could exceed 10 knots. Up to 276 vessels associated with offshore wind development could be operating in the GAA during the peak construction period in 2025. Additional fishing vessels could also 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 3.16 and COP Appendix R [DNV GL Energy USA, Inc. 2020]). Despite the unlikely potential for individual fatalities, no population-level impacts on sea turtles are expected based on occurrence and potential exposure. Assuming other offshore wind projects employ the same minimization measures included in this Project (see Table F-1 in Appendix F), impacts would be further reduced and would be considered **negligible** to **minor** adverse.

Onshore Activities and Facilities

The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.

3.19.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts associated with the Project to sea turtles would not occur. However, ongoing and future activities would have continuing temporary to long-term impacts on sea turtles, primarily through, but not limited to, construction-related lighting, noise, habitat alternation, collision risk, and the artificial reef effect.

Based on the current science, BOEM anticipates that the impacts of ongoing activities, especially vessel traffic, commercial and recreational fisheries gear interaction, and climate change, would be minor. In addition to ongoing activities, reasonably foreseeable activities other than offshore wind development include increased vessel traffic; new submarine cables and pipelines; channel-deepening activities; and the installation of new towers, buoys, and piers. BOEM anticipates that the impacts of reasonably foreseeable activities other than offshore wind would be minor. BOEM expects that the combination of ongoing activities and reasonably foreseeable activities other than offshore wind development to result in minor impacts on sea turtles, driven primarily by increasing vessel traffic and interactions with commercial and recreational fisheries gear.

The combined impact-level criteria in Table 3.3-2 and Table 3.3-3 in Chapter 3 are used to characterize the combined effects of all IPFs likely to occur in the GAA under the No Action Alternative. 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 **minor** adverse impacts from construction and operational noise and exposure to vessel traffic and **minor** beneficial impacts to sea turtles from increased biological productivity created by reef effects. Those impacts would range from short term to long term in duration. Future offshore wind activities are expected to contribute considerably to several IPFs, the most prominent being the presence of structures——namely foundations, scour/cable protection, and pile-driving noise.

The No Action Alternative would forgo any monitoring that Revolution Wind has committed to perform, the result of which could provide an understanding of the effects of offshore wind development, benefit future management of sea turtles, and inform planning of other offshore developments. However, other ongoing and future surveys could provide similar data.

3.19.2 Environmental Consequences

3.19.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

The analysis presented in this section considers the impacts resulting from the maximum-case scenario under the PDE approach developed by BOEM to support offshore wind project development (Rowe et al. 2017). The maximum design size specifications defined in Appendix D, Table D-1 are PDE parameters used to conduct this analysis. Several Project parameters could change during the development of the final Project configuration, potentially reducing the extent and/or intensity of impacts resulting from the associated IPFs.

The following design parameters would result in reduced impacts relative to those generated by the design elements considered under the PDE:

- The permitting and installation of fewer WTGs, resulting in fewer offshore structures and reduced IAC cable length. This would reduce the extent of temporary to long-term impacts on marine mammals by
  - reducing the extent and duration of underwater noise impacts from WTG foundation installation; and
  - reducing the extent of reef and hydrodynamic effects resulting from structure presence.
- The Project could use a casing pipe method to construct the RWEC sea-to-shore transition, which would result in less acoustic impact than vibratory pile driving to construct a cofferdam (Zeddies 2021).
- The use of a temporary cofferdam for RWEC sea-to-shore transition construction would reduce suspended sediment effects on sea turtles.

See Appendix E2 for a summary of IPFs analyzed for sea turtles across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Appendix E, Table E2-6.

Table 3.19-2 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion. This comparison considers the implementation of all EPMs proposed by Revolution Wind to avoid and minimize adverse impacts on sea turtles. These EPMs are summarized in Appendix F, Table F-1.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

The conclusion section within each alternative analysis discussion includes rationale for the overall effect determination. Overall impacts associated with the each alternative would result in **minor** adverse impacts on sea turtles in the GAA because unavoidable adverse impacts on individual sea turtles could occur, but those impacts are unlikely to measurably affect the viability of any sea turtle species at the population level.

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Table 3.19-2. Alternative Comparison Summary for Sea Turtles

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Accidental releases and discharges	**Offshore**: While marine vessels are an inherent source of accidental releases of trash, debris, and contaminants, existing regulatory requirements would effectively avoid and minimize these impacts such that the resulting effects to sea turtles would be **negligible** adverse. All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and the BSEE Oil spill response plans are required for each project and would provide for rapid spill response, clean-up, and other measures that would help to minimize potential impacts on affected resources. Given the low probability of a large spill event, impacts to sea turtles are likely to be **negligible** adverse.	**Offshore**: BOEM prohibits the discharge or disposal of solid debris into offshore waters during any activity associated with the construction and operation of offshore renewable energy facilities (30 CFR 585.105(a)). The USCG similarly prohibits the dumping of trash or debris capable of posing entanglement or ingestion risk (MARPOL, Annex V, Public Law 100–220 (101 Stat. 1458)). The Project would comply with these requirements (Jacobs 2020). Given these restrictions, the short-term impacts to sea turtles from trash and debris from the Project would be **negligible** adverse. Project EPMs, permit requirements, controls, and procedures would be implemented as part of the Project to reduce the potential or extent of offshore spills, thereby avoiding or minimizing impacts on water quality. Should a spill occur, response and containment procedures would limit the reach of the spill to a localized area, where changes to water quality would be detectable and would exceed water quality standards. Given the low potential for spills and minimal risk of exposure to small temporary spills, the risk from construction-related spills is **negligible** to **minor** adverse. Impacts on sea turtles from accidental spills or releases of pollutants are considered **minor** adverse during O&M because of the low probability of the risk and EPMs. Cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **negligible** to **minor** adverse because of the regulatory protections and limited likelihood of sea turtle exposure.	**Offshore:** Effects on sea turtles from accidental releases and discharges under Alternatives C through F would be similar to those described for the Proposed Action. Alternatives C through F would include the same EPMs to avoid and minimize impacts to sea turtles from accidental releases and discharges. Effects on sea turtles would therefore be **negligible** adverse and short term. While unlikely, vessels collision or allisions could occur during Project construction, presenting the potential risk of larger spills, potentially harmful to sea turtles. Alternatives C through F would slightly reduce total chemical and lubricant uses relative to the Proposed Action, but this effect would be small in comparison to projected chemical use on the mid-Atlantic OCS. When combined with other offshore wind projects, up to approximately 19 million gallons of coolants, fuels, oils, and lubricants could cumulatively be stored within WTG foundations and OSSs. However, all future offshore energy development projects would comply with BOEM and USCG regulations that prohibit dumping of trash and debris and require measures to avoid and minimize accidental spills. Cumulative impacts associated with the Habitat Alternative when combined with past, present, and reasonably foreseeable future activities would be **negligible** to **minor** adverse.			
	Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, impacts of onshore activities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.			
Climate change	**Offshore**: 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. However, sea turtle populations likely to be impacted by the Project are stable or generally increasing from historic lows. Therefore, potential climate change impacts would be **minor** adverse.	**Offshore**: Northward shifts in sea turtle distributions due to warming waters could result in magnification of the anticipated impacts due to increased exposure. However, this magnification includes potential benefits associated with the creation of artificial reef habitat and could represent an increasing impact over the life of the Project. Therefore, the Proposed Action when combined with other past, present, and reasonably foreseeable actions is expected to result in **minor** adverse cumulative impacts to sea turtles due to the anticipated shifts in distributions.	**Offshore:** The types of impacts from global climate change described for the No Action Alternative would occur under Alternatives C through F, but as with the Proposed Action, this alternative could also contribute to a long-term net decrease in GHG emissions.However, northward shifts in sea turtle distributions due to warming waters could result in magnification of the anticipated impacts due to increased exposure. This magnification includes potential benefits associated with the creation of artificial reef habitat and could represent an increasing impact over the life of the Project. Therefore, Alternatives C through F when combined with other past, present, and reasonably foreseeable actions and ongoing environmental trends is expected to result in **minor** adverse cumulative impacts to sea turtles.			
	Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, impacts of onshore activities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
	and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.					
Noise	**Offshore**: Under the No Action Alternative, human activities would continue to generate underwater noise with the potential to affect sea turtles. These short-term impacts on individuals are not expected to result in population-level effects; the effects of impulsive noise on sea turtles would therefore be **minor** adverse, while effects of non-impulsive noise on sea turtles would be **negligible** adverse because of the patchy distribution of sea turtles and limited likelihood of behavioral responses to expected noise levels.	**Offshore**: A temporary increase in underwater noise could impact sea turtles if they are present in the area during the time of RWF and offshore RWEC construction. Sea turtles that are close to impact pile driving could experience a temporary or permanent loss of hearing sensitivity. Sea turtles could also respond to vessel approach and/or noise with a startle response and a temporary stress response. Based on the combination of minimization measures and the low numbers of sea turtles expected in the RWF and RWEC, however, impacts to sea turtles from impact pile driving are expected to be **negligible** to **minor** adverse and impacts to sea turtles from vessel noise would be **negligible** adverse. Likewise, underwater noise impacts from HRG surveys are expected to be **minor** adverse and aircraft noise impacts sea turtles are expected to be **negligible** adverse because exposures would be limited in extent and temporary in duration. Project decommissioning would require the use of construction vessels of similar number and class as those used during construction, and would therefore range from **negligible** to **minor** adverse. Sea turtle hearing is largely within the frequency range (< 1,200 Hz) of operational wind turbines; therefore, it is possible that wind turbine noise could be heard by sea turtles, although behavioral responses are unlikely based on the established threshold, resulting in **negligible** adverse effects. Based on the above findings, noise-related impacts of the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts to sea turtles, depending upon the noise source.	**Offshore:** See Section 3.19.2.3.1 for construction analysis. Alternatives C through F would include the same, or similar, operational and decommissioning noise-producing activities as those described for the Proposed Action but would be reduced based on the reduction in the number of WTGs and other operational elements. Thus, the impacts of operational and cumulative noise are also considered **negligible** to **minor** adverse.			
	Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, impacts of onshore activities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Presence of structures	**Offshore**: The addition of up to 3,008 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). In contrast, broadscale hydrodynamic impacts could alter zooplankton distribution and abundance and concentrate recreational and commercial fishing around foundations, which could indirectly increase the potential for sea turtle entanglement in both lines and nets. Therefore, associated effects of structures on sea turtles through potential reef effects, hydrodynamic impacts, and concentration of fishing would be **minor** adverse, offset by **minor** beneficial impacts to sea turtle species that benefit from reef effects.	**Offshore**: Construction and installation of offshore structures would have temporary **negligible** to **minor** adverse effects on sea turtles, varying in significance by species, due to underwater noise impacts related to impact pile driving and noise and disturbance from associated vessel activity. Potential long-term, intermittent impacts could persist until decommissioning is complete and structures are removed. These O&M impacts would be **negligible** to **minor** adverse, offset by **minor** beneficial impacts to sea turtle species that benefit from reef effects. BOEM estimates a cumulative total of 3,110 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the GAA. For similar reasons as described above, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts and potential **minor** beneficial cumulative impacts to sea turtles.	**Offshore**: Alternatives C through F would result in impacts to sea turtles associated with the presence of WTG and OSS foundations that are similar to those described for the Proposed Action, but those effects would be reduced in extent. This would reduce the extent of long-term impacts on benthic habitat, water flow, prey aggregation, and fishing activity. This would also reduce the extent of antcipated hydrodynamic and reef effects. But given the offsetting nature of anticipated effects, the differences between alternatives on sea turltes would be uncertain. As with the Proposed Action, the overall impact to sea turtles from the presence of structures is not expected to be biologically significant due to the patchy distribution of sea turtles within the RWF and RWEC. Indirect effects on the prey base of some sea turtle species (i.e., invertebrates) from the presence of structures would occur. Potential long-term, intermittent impacts would persist until decommissioning is complete and structures are removed. These impacts would be **negligible** to **minor** adverse, offset by **minor** beneficial impacts to sea turtle species that benefit from reef effects.			
	Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, impacts of onshore activities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Vessel traffic	**Offshore**: Increased vessel traffic could result in sea turtle injury or mortality; however, the proportional increase in vessel traffic from baseline would be minimal. Despite the unlikely potential for individual fatalities, no population-level impacts on sea turtles are expected based on occurrence and potential exposure. Assuming other offshore wind projects employ similar minimization measures included in this Project (see Table F-1 in Appendix F), impacts would be further reduced and would be considered **negligible** to **minor** adverse.	**Offshore**: Vessel collisions with individual turtles could occur, resulting in mortalities. Because the abundance of sea turtles is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic is also low, the number of sea turtles injured or killed by vessel strikes during Project construction would be low and would have negligible effects at the population level. Therefore, the potential effects of construction and decomissioning vessel collisions on sea turtles would be **minor** adverse. O&M vessel use would represent a minimal increase in regional vessel traffic over the life of a facility and the effects to sea turtles are expected to be **negligible** to **minor** adverse. An increase in vessel traffic poses an increased likelihood of collision-related injury and mortality relative to existing baseline conditions. Some sea turtles could be injured or killed as a result, but the number of individuals impacted is not likely to significantly increase the existing mortality rate from vessel strikes. Additionally, BOEM expects that similar EPMs will be included in future offshore wind projects, helping to minimize the vessel strike risk. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse; BOEM does not expect the viability of sea turtle populations to be affected.	**Offshore:** Alternative C to F would require the same types and number of construction O&M and decommissioning vessels producing the similar impacts to those described for the Proposed Action, but the number of vessel trips and overall duration of construction activity would be reduced. The risk of collisions, disturbance, and other associated effects on sea turtles would similarly be reduced consistent with the overall reduction in vessel trips required to construct each alternative configuration. Thus, vessel traffic associated with the RWF would be expected to increase less than the 2.1% per year across transects 13–17 (see Figure 3.15-2) estimated for the Proposed Action. For the Proposed Action, Revolution Wind (Tech Environmental 2021) has estimated that Project O&M would involve up to four CTV and two SOV trips per month for wind farm O&M, or 2,280 vessel trips over the life of the Project. It can be assumed that the Transit Alternative would require similar or slightly fewer vessel trips during O&M. Sea turtles are likely to be most susceptible to vessel collision in coastal foraging areas crossed by construction vessels traveling between the RWF and offshore RWEC 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. Project EPMs include the implementation of NOAA vessel guidelines (see Appendix F) for marine mammal and sea turtle strike avoidance measures, including vessel speed restrictions. Nevertheless, collisions with individual turtles could occur, resulting in mortalities. Because the abundance of sea turtles is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic is also low, the number of sea turtles injured or killed by vessel strikes during Project construction would be low and would have negligible effects at the population level. O&M vessel use would represent a minimal increase in regional vessel traffic over the life of the Project and, as detailed in the EPMs listed in Table F-1 in Appendix F, all survey vessels would comply with speed restrictions and other minimization measures to minimize risk of collision with sea turtles, making the risk of vessel strikes from Project monitoring vessels unlikely. Therefore, the potential effects of vessel collisions on sea turtles would **negligible** to **minor** adverse for the life of the Project; BOEM does not expect the viability of sea turtle populations to be affected.			
	Onshore: The construction and installation, O&M, and eventual decommissioning of onshore project facilities and related activities associated with planned and potential future offshore wind energy projects would not be expected to result in measurable impacts on the marine environment. Therefore, the onshore components of planned and future projects are likely to have no measurable effects on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.	**Onshore:** Onshore Project activities would not result in impacts to marine resources regardless of alternative. Therefore, impacts of onshore activities to sea turtles would be the same as those for the No Action Alternative: **negligible** adverse.			

3.19.2.2 Alternative B: Impacts of the Proposed Action on Sea Turtles

3.19.2.2.1 Construction and Installation

Offshore Activities and Facilities

Construction impacts to sea turtles could occur from accidental releases and discharges, artificial lighting, seafloor disturbance, entrainment and impingement, underwater and airborne noise, vessel traffic (strikes and noise), and water quality degradation. The potential for these impacts to occur are discussed in detail by IPF.

Accidental releases and discharges: During construction of the RWF and RWEC, 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 individuals (Vargo et al. 1986). Any nonroutine 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 Project SPCC plan and other EPMs (see Table F-1 in Appendix F). Impacts on sea turtles from accidental spills or releases of pollutants are considered negligible because of the low probability of the risk and EPM implementation.

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. See Section 3.15.2 for additional debris and entanglement analysis. 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 RWF are considered minor because implementation of proposed EPMs would lower the probability of such risk.

BOEM prohibits the discharge or disposal of solid debris into offshore waters during any activity associated with the construction and operation of offshore energy facilities (30 CFR 585.105(a)). The USCG similarly prohibits the dumping of trash or debris capable of posing entanglement or ingestion risk (MARPOL, Annex V, Public Law 100−220 (101 Stat. 1458)). The Project would comply with these requirements (Jacobs 2020). Given these restrictions, the short-term impacts to sea turtles from trash and debris from the Project would be **negligible** adverse.

Construction vessels also pose a potential risk for Project-related accidental spills. As described in Section 3.21.2.2.1, the chance of a spill occurring due to vessel allisions or collisions would be low (once per 1,000 years). In the unlikely event an allision or collision involving Project vessels or components resulted in a high-volume spill, impacts on water quality would be minor to moderate adverse and temporary to long term, depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill. Project EPMs, permit requirements, controls, and procedures would be implemented as part of the Project to reduce the potential or extent of offshore spills, thereby avoiding or minimizing impacts on water quality. Should a spill occur, response and containment procedures would limit the reach of the spill to a localized area, where changes to water quality would be detectable and would exceed water quality standards. Given the low potential for spills and minimal risk of exposure to small temporary spills, the risk from construction-related spills is **negligible** to **minor** adverse.

Noise: A temporary increase in underwater noise is the most likely construction-related factor that could impact sea turtles if they are present in the area during the time of RWF and offshore RWEC construction. Construction noise sources include impact and vibratory pile driving, UXO detonation, HRG surveys, construction vessels, and helicopters and fixed-wing aircraft.

The current literature and effect analysis guidance regarding sensitivity to underwater noise effects vary depending on the source. Popper et al. (2014) reviewed available data and suggested the threshold levels of 207 peak decibels (dB re 1 µPa) and 210 decibels referenced to the sum of cumulative pressure in micropascals squared, normalized to 1 second (dB re 1 $\mu Pa^2 s$) for injurious (i.e., hearing loss) underwater noise for sea turtles. These recommended criteria are for mortality and potential mortal injury. NMFS has considered injury onset for PTS (i.e., permanent hearing injury) beginning at 232 dB re 1 µPa and 204 dB re 1 $\mu Pa^2 s$ and TTS (i.e., a temporary and recoverable loss of hearing sensitivity) beginning at 226 peak dB re 1 µPa and 189 cumulative dB re 1 $\mu Pa^2 s$ (Navy 2017). Exposure modeling for the extent of injurious effects from impulsive underwater noise was completed by Kusel et al. (2021) using the Navy (2017) thresholds, including a behavioral response SPL threshold of 175 rms dB re 1 µPa. These thresholds apply to juvenile, subadult, and adult life stages.

Table 3.19-3 summarizes thresholds for underwater noise effects and the maximum distances to injurious and behavioral effects from construction-related underwater noise levels from construction-related activities, including impact pile driving (Kusel et al. 2021), UXO detonation (Hannay and Zykov 2021), and HRG surveys (BOEM 2021b). These effects are described in greater detail below.

Table 3.19-3. Distances to Sea Turtle Underwater Noise Injury and Behavioral Thresholds for Wind Turbine Generator and Offshore Substation Foundation Installation

Activity†	Number of Sites	Total Days	Noise Exposure Type	Exposure Threshold*	Range of Threshold Distances (feet)‡
12-m WTG monopile foundation installation	100	33	Peak injury	232	–
			Cumulative Injury	204	98–689
			Behavioral or TTS	175	1,903–2,920
15-m OSS monopile foundation installation	2	2	Peak injury	232	–
			Cumulative Injury	204	0–820
			Behavioral or TTS	175	2,362–3,182
Temporary cofferdam installation	1	14	Cumulative injury	210	102
			Behavioral or TTS	189	174

Activity†	Number of Sites	Total Days	Noise Exposure Type	Exposure Threshold*	Range of Threshold Distances (feet)‡
UXO detonation	13	13	Injury	204	207–1,699
			TTS	189	354–8,235
HRG surveys	10,755	248	Behavioral	189	0–300
Construction vessel operation	N/A	~730	Behavioral or TTS	189	–

* Peak injury thresholds are SPL in dB re 1 μPa; cumulative injury thresholds are frequency-weighted SEL in dB re 1 $\mu Pa^2 \cdot s$ based on 24 hours of continuous exposure. The peak injury threshold is not recommended for estimating risk of injury from UXO detonation (Hannay and Zykov 2021).

† Installation scenario for 12-m monopile is 6,500 strikes/pile at installation rate of three piles/day. Installation scenario for 15-m monopile is 11,500 strikes/pile at installation rate of one pile/day. All piles installed with a 4,000-kJ hammer with an attenuation system achieving 10 dB sound source reduction. Sound source scenario for UXOs assumes detonation of thirteen 1,000-pound explosives with 10 dB of sound source attenuation.

‡ Pile-driving values are maximum threshold distances modeled by Kusel et al. (2021) for winter conditions. UXO detonation values are the range of maximum distances modeled by Hannay and Zykov (2021) for 5- to 1,000-pound explosive devices. Both sets of values assume 10 dB of sound attenuation.

As shown in Table 3.19-3, impact pile driving and UXO detonation produce sufficient underwater noise to cause permanent hearing injury and behavioral effects on sea turtles. The combined impact area for pile driving is sufficiently large that the potential for hearing injury to some sea turtles cannot be discounted. Orsted anticipates that up to 13 UXOs ranging from 5 to 1,000 pounds in size may need to be detonated in place (LGL 2022). The number, size, and distribution of UXOs potentially occurring in the Maximum Work Area is not currently known, but the largest devices are most likely to be found within the central portion of the RWF and on the RWEC corridor in state waters at the mouth of and outside of Narragansett Bay (Ordtek 2021). The extent and duration of exposure to potential injury-level effects from UXO detonation is relatively small in comparison to pile driving. This suggests that even under the maximum impact scenario considered in this analysis, the risk of permanent hearing injury to sea turtles is relatively low.

Little is known about the role of sound perception in the sea turtle's typical activities. Although sea turtles have relatively unspecialized ears relative to other vertebrate species, their auditory organs appear to be specifically adapted to underwater hearing (Dow Piniak et al. 2012). Studies indicate that hearing in sea turtles is confined to lower frequencies, below 1,200 Hz, with the range of highest sensitivity between 100 and 700 Hz (Dow Piniak et al. 2012), with some variation between species (Bartol and Ketten 2006; Dow Piniak et al. 2012; Martin et al. 2012; Piniak et al. 2016). In captive enclosures and during NSF-funded at-sea seismic monitoring programs, sea turtles generally respond to seismic survey sound with behavioral changes such as startling, increasing swimming speed, and swimming away from and/or locally avoiding the source (McCauley et al. 2000; NSF and USGS 2011). The majority of pile-driving activities are expected to take place during daylight hours. However, pile driving could occur at any time night under specific circumstances.[3] Sea turtles migrating through the area when pile driving occurs are

[3] Installation of each foundation pile would begin during daylight hours with the intent of completion before dark. However, in certain circumstances the installation process may be delayed or take longer than anticipated. This may require continuing impact pile driving after dark if the installation must be completed for safety purposes and/or to ensure structural stability.

expected to adjust their course to avoid the area where noise is elevated above 175 dB re 1 μPa. Depending on how close the individual is to the pile being driven, this could involve swimming a mile or more to avoid stressful noise levels. 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 sea turtle may experience physiological stress during this avoidance behavior, but this stressed state would be anticipated to dissipate over time once the turtle is outside the ensonified area. Either a temporary or permanent reduction in hearing sensitivity could be harmful for sea turtles, but the potential extent and magnitude 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 (see Table F-1 in Appendix F) would minimize the risk of sea turtle exposure to elevated underwater noise levels. The efficacy of exclusion and monitoring zones would be less during periods of nighttime pile driving, potentially exposing more individuals to elevated underwater noise.

Foraging disruptions due to displacement would be temporary and are not expected to last longer than a few hours per day when pile driving occurs. This displacement would result in a relatively small energetic consequence that would not be expected to have long-term impacts on sea turtles. Construction activities could temporarily displace animals into areas that have a lower foraging quality or result in higher risk of interactions with ships or fishing gear. However, the duration of disturbance is limited to active pile driving (i.e., approximately 220 and 380 minutes per WTG and OSS monopile, respectively), and individuals could become habituated to repeated exposures over time and ignore a stimulus that was not accompanied by an overt threat (Hazel et al. 2007).

Impact pile driving during construction is the loudest potential impulsive underwater noise source associated with the Project and would produce the most extensive effects. As discussed in Section 3.19.1.1, 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 could include altered submergence patterns, temporary disturbance, startle response (diving or swimming away), and temporary 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 life stage could have long-term impacts on survival and fitness (Navy 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 even when the repeated exposures were separated by several days (Bartol and Bartol 2011; Navy 2018).

Kusel et al. (2021) developed estimates of the number of sea turtles that could be exposed to potential adverse noise-related effects from WTG and OSS foundation installation. They used a sophisticated exposure model to estimate the number of individuals by species that could be exposed to PTS, TTS, and other temporary physiological and behavioral effects from construction noise exposure. The analysis used a conservative construction schedule in which the WTG and OSS installation was concentrated during the highest density months for each species, with up to three piles per day for 30 days. Based on the established timing restrictions to protect marine mammal species (i.e., NARWs), construction would occur primarily during the summer months when sea turtles (especially loggerheads and leatherbacks) have a higher likelihood of being present. The density estimates supporting the analysis are therefore likely representative of densities when construction activities would occur. The exposure estimates presented in Table 3.19-4 assume a broadband attenuation of 10 dB and a Project construction duration of approximately 35 days, assuming an aggressive installation schedule of three WTG and one OSS foundations per day.

Hannay and Zykov (2022) used a similar model to estimate the threshold distances for PTS and TTS exposure from UXO detonation. Turtles within 689 feet of UXO detonation could experience injury based on the threshold of 210 dB re 1 $\mu Pa^2 s$. Turtles within 1,699 feet exposed to multiple UXO detonations in a single day could experience accumulated injury from based on the 204 dB SEL dB re 1 $\mu Pa^2 s$. Turtles within 8,235 feet of UXO detonation could experience behavioral impacts based on the threshold of 189 dB re 1 $\mu Pa^2 s$. The UXO detonation plan would include the same or similar sound attenuation, PSOs, and site clearance EPMs used for pile driving (see Table F-1, Appendix F) to avoid and minimize adverse impacts to sea turtles. These exposure estimates do not consider the benefits to sea turtles from avoiding accidental uncontrolled UXO detonations that could occur in the absence of the Project. Zykov (2022) developed an exposure model to estimate the number of individuals by species that could be exposed to PTS and TTS from UXO detonation. The exposure scenario for UXOs assumes that thirteen 1,000-pound devices would require detonation within the RWF and RWEC work areas and that the devices are distributed such that the exposure areas would not overlap. Zykov (2022) determined that less than one individual leatherback and less than one individual loggerhead sea turtle could be exposed to PTS or TTS effects from UXO detonation in the RWEC corridor, and none would be exposed to these effects from detonations in the RWF. No Kemp’s Ridley or green sea turtles are likely to be exposed to PTS or TTS effects in either area.

Table 3.19-4. Estimated Number of Sea Turtles Experiencing a Permanent Threshold Shift and Temporary Threshold Shift or Behavioral Effects from Construction-Related Impact Pile Driving

<table>
<tr><th>Species</th><th>Source</th><th>PTS Cumulative Sound Exposure (number of indivuals)</th><th colspan="2">PTS from Peak Sound Pressure Exposure (number of indivuals)</th><th>TTS or Behavioral Effects (number of indivuals)</th><th>Effect Significance*</th></tr>
<tr><td rowspan="2">Kemp’s ridley turtle</td><td>Impact pile driving</td><td>< 0.01</td><td colspan="2">0</td><td rowspan="2">< 1</td><td rowspan="2">Negligible</td></tr>
<tr><td>UXO detonation</td><td>--</td><td>0</td><td>0</td></tr>
<tr><td rowspan="2">Leatherback turtle</td><td>Impact pile driving</td><td>< 1</td><td colspan="2">0</td><td rowspan="2">8</td><td rowspan="2">Minor</td></tr>
<tr><td>UXO detonation</td><td>--</td><td>< 1</td><td>< 1</td></tr>
<tr><td rowspan="2">Loggerhead turtle</td><td>Impact pile driving</td><td>< 1</td><td colspan="2">0</td><td rowspan="2">4</td><td rowspan="2">Minor</td></tr>
<tr><td>UXO detonation</td><td>--</td><td>< 1</td><td>< 1</td></tr>
<tr><td rowspan="2">Green turtle[†]</td><td>Impact pile driving</td><td>< 0.01</td><td colspan="2">0</td><td rowspan="2">< 1</td><td rowspan="2">Negligible</td></tr>
<tr><td>UXO detonation</td><td>--</td><td>0</td><td>0</td></tr>
</table>

Source: Kusel et al. (2021), Zykov (2022)

Note: Modeled exposure estimates based on impact hammer installation of one hundred 12-m and two 15-m monopiles. Installation scenario assumes use of a noise attenuation system achieving 10-dB effectiveness. Values < 1 indicate a modeled exposure estimate of greater than 0 but less than 0.5 affected individual, which is considered a result of zero for regulatory purposes.

* See impact significance criteria definitions in Chapter 3, Table 3.3-2.

[†] Kraus et al. (2016) did not observe any green sea turtles in the RI/MA WEA. Densities of Kemp’s ridley sea turtles are used as a conservative estimate.

Sea turtles that are close to impact pile driving could experience a temporary or permanent loss of hearing sensitivity. However, the potential effects on sea turtles are reduced through the implementation of EPMs and additional minimization measures (see Appendix F), including PSOs, soft starts, and noise attenuation systems. Reduced hearing sensitivity could limit the ability to detect predators and prey or find potential mates, reducing the survival and fitness of affected individuals, but the role and importance of hearing in these biological functions for sea turtles remain poorly understood (Lavender et al. 2014). Based on the combination of minimization measures and the low numbers of sea turtles expected in the RWF and RWEC, impacts to sea turtles from impact pile driving are expected to be **negligible** to **minor** adverse.

Vibratory pile driving could be used to install cofferdams for the RWEC sea-to-shore transition at Quonset Point. Similar to the effects of the impulsive impact hammer, only minor impacts to sea turtles from vibratory pile driving are expected because of the combination of minimization measures used and the low densities of sea turtles in the RWF and RWEC. Noise from vibratory pile driving at the sea-to-shore transition would be constrained within the natural geography of Narragansett Bay. Vibratory pile-driving noise is unlikely to exceed recommended sea turtle injury thresholds and would only exceed behavioral thresholds within 175 feet of the source (BOEM 2021a). Given the limited spatial extent of these potential effects, sea turtles are more likely to respond to disturbance from construction vessels staging on-site before pile driving begins. This suggests that the potential for exposure to vibratory pile-driving noise is limited at best, with vessel noise and disturbance being the more likely source of potential behavioral effects.

HRG surveys use a combination of sonar-based methods to map shallow geophysical features. Up to 10,755 linear miles of preconstruction surveys would be conducted to support Project installation. The equipment is towed behind a moving survey vessel attached by an umbilical cable. HRG equipment operating at frequencies below 2,000 Hz (typically sub-bottom profilers) may be audible to sea turtles. Equipment such as echosounders and side-scan sonars operate at higher frequencies andwould be outside the hearing range of sea turtles,therefore having no effect on these species. The equipment only operates when the vessel is moving along a survey transect, meaning that the ensonified area is intermittent and constantly moving. BOEM (2021b) evaluated evaluated potential underwater noise effects on sea turtles from HRG surveys and concluded there is no possibility of PTS in sea turtles from HRG sound sources because of the brief and intermittent disturbances that a vessel could have on individuals. Some HRG survey noise sources would exceed the behavioral effects threshold up to 300 feet from the source, depending on the type of equipment used, but given the limited extent of potential noise effects and the EPMs used in this Project (e.g., soft start measures, shutdown procedures, protected species monitoring protocols, use of qualified and NOAA-approved PSOs, and noise attenuation systems), adverse impacts to sea turtles are unlikely to occur. While low-level behavioral exposures could occur, these would be limited in extent and temporary in duration (BOEM 2021b). Therefore, underwater noise impacts from HRG surveys are expected to be **minor** adverse.

The relatively low frequency range of turtle hearing (100–1,200 Hz) (Ketten and Bartol 2006; Lavender et al. 2014) overlaps the broad frequency spectrum of noise produced by vessels (10–1,000 Hz). Sea turtles could respond to vessel approach and/or noise with a startle response and a temporary 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 could increase the potential for vessel collision (refer to 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** adverse.

Fixed-wing aircraft could be used during construction for marine mammal monitoring, and helicopters could be used for crew transport to and from construction vessels. Monitoring aircraft would operate at an altitude of 1,000 feet. Noise levels generated by helicopters and propeller-driven aircraft at this altitude range from 65 to 85 dBA (Behr and Reindel 2008; Brown and Sutherland 1980). 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 could cause some temporary non-biologically significant behavioral reactions, including startle responses (diving or swimming away), altered submergence patterns, and a temporary stress response (BOEM 2017; NSF and USGS 2011; Samuel et al. 2005), these brief responses would be expected to dissipate once the aircraft has left the area. The potential effects of aircraft noise and disturbance on sea turtles are therefore expected to be **negligible** adverse.

Overall, based on the limited likelihood of exposure and implementation of effective EPMs and minimization measures, the noise effects on sea turtles during construction would be **negligible** to **minor** adverse.

<u>Presence of structures:</u> Effects on sea turtles from the construction and installation of WTG and OSS foundations would result primarily from underwater noise impacts related to impact pile driving and noise and disturbance from associated vessel activity. These impacts are described under the applicable IPFs for each type of disturbance. Indirect effects on sea turtles, such as reduced availability of forage or prey, could also result from impacts on benthic habitat and invertebrate prey species. These effects, including the anticipated acreages of benthic habitat affected by the presence of structures, are described in Sections 3.6.2.2.1 and 3.6.2.3.1. While indirect effects to invertebrate prey resources would occur, these impacts are not likely to significantly affect the availability of prey and forage resources for sea turtles because of their broad resource base and the minimal anticipated adverse effect to invertebrates during the construction phase. Therefore, construction and installation of offshore structures would have temporary, **negligible** to **minor** adverse effects on sea turtles, varying in significance by species.

<u>Vessel traffic:</u> Changes in vessel traffic resulting from the Proposed Action are a potential source of adverse effects on sea turtles. 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, when not accompanied by an overt threat. Project construction vessels could collide with sea turtles, posing a temporary increase in the risk of injury or death to individual sea turtles. However, implementation of a range of EPMs to avoid vessel collisions (see Appendix F, Table F-1) are expected to minimize the risk of

collisions with sea turtles. 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 speed restrictions to 10 knots or less in DMAs. All vessel crews would receive training to ensure these EPMs are fully implemented for vessels in transit. Once on station, the construction vessels 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 and HRG survey vessels also move slowly, with typical operational speeds of less than 1 and approximately 4 knots, respectively.

Based on information provided by Revolution Wind (Tech Environmental 2021), BOEM estimates that Project construction would require up to 968 one-way trips by various classes of vessels between the RWF and regional ports in Rhode Island, Massachusetts, Connecticut, New Jersey, Virginia, and Maryland, as well as ports in Europe, over the 2-year construction period. This equates to approximately 40 trips per month, or 484 trips per year. In addition, approximately 10,755 linear miles of preconstruction HRG surveys are anticipated to support micrositing of the WTG foundations and cable routes. HRG surveys could occur during any month of the year and would require a maximum of 248 total vessel days. The construction vessels used for Project construction are described in Table 3.3.10-3 in the COP and include jack-up WTG installation vessels, foundation installation vessels, supply vessels and feeder barges, bunkering vessels, cable laying vessels, and various support craft. Typical large construction vessels used in this type of project range from 325 to 350 feet in length, from 60 to 100 feet in beam, and draft from 16 to 20 feet (Denes et al. 2021).

Large construction vessels and barges would account for an estimated 44% of these one-way trips, with the remainder comprising CTVs and other small support vessels. BOEM developed a representative analysis of construction vessel effects on regional traffic volume by evaluating the potential increase in transits across a set of analysis cross sections relative to baseline levels of vessel traffic. These cross sections were developed by DNV GL Energy USA, Inc. (2020) to support the COP and are shown in Figure 3.15-2.

Using the port of origin information provided by Revolution Wind (Tech Environmental 2021), the estimated 484 construction vessel trips per year would cross transects 13-17 when leaving the RWF and could cross several different transects depending on the destination port. This would equate to a 23% increase in vessel transits across these transects. However, the Automatic Identification System (AIS) data used in transect analysis do not include many recreational vessels and virtually all commercial fishing vessels when actively fishing. These vessel types account for the vast majority of vessel activity. For example, DNV GL Energy USA, Inc. (2020) estimated over 19,000 one-way trips per year by commercial fishing vessels between the RWF and area ports. When these vessel trips are included, Project construction would result in a 2.1% increase in vessel transits per year across transects 13-17. In summary, this assessment indicates that construction vessels would likely increase vessel traffic to some degree, and large vessel traffic would measurably increase during the 2-year construction period. This indicates the potential for increased risk of sea turtle collisions in the absence of planned EPMs and other requirements.

Sea turtles are likely to be most susceptible to vessel collision in coastal foraging areas crossed by construction vessels traveling between the RWF and offshore RWEC 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 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 3 to 30 miles per day, with a maximum speed of approximately 1.2 miles per hour. Project EPMs include the implementation of NOAA vessel guidelines (see Appendix F) for marine mammal and sea turtle strike avoidance measures, including vessel speed restrictions. Nevertheless, collisions with individual turtles could occur, resulting in mortalities. Because the abundance of sea turtles is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic is also low, the number of sea turtles injured or killed by vessel strikes during Project construction would be low and would have negligible effects at the population level. Therefore, the potential effects of construction vessel collisions on sea turtles would be **minor** adverse.

Onshore Activities and Facilities

Construction of onshore Project facilities and associated activities would not result in measurable impacts on the marine environment. Therefore, onshore activities and facilities would have no measurable effect on sea turtles and would therefore be **negligible** adverse.

3.19.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

<u>Accidental releases and discharges:</u> The RWF would undergo maintenance as needed, which would necessitate vessels and other equipment at the facility for the life of the Project. This presents an opportunity for accidental discharge or spills of fuels and/or fluids during maintenance activities. Spill response EPMs (see Table F-1 in Appendix F) employed during construction would be implemented during maintenance activities. These EPMs 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** adverse because of the low probability of the risk and EPMs (refer to Section 3.21 for additional details).

<u>Noise:</u> WTG operations, O&M and monitoring vessels, and postconstruction HRG surveys would generate underwater noise detectable by sea turtles. Tougaard et al. (2020) summarized available monitoring data on wind farm operational noise, including both older generation geared turbine designs and quieter modern direct-drive systems like those proposed for the RWF. They determined that operating turbines produce underwater noise on the order of 110 to 125 dB_{RMS}, occasionally reaching as high as 128 dB_{RMS}, in the 10-Hz to 8-kHz range. This is consistent with the noise levels observed at the BIWF (110 to 125 dB re 1 µPa SPL rms) (Elliot et al. 2019) and the range of values observed at European wind farms and is therefore representative of the range of operational noise levels likely to occur from future wind energy projects. More recently, Stober and Thomsen (2021) used monitoring data and modeling to estimate operational noise from larger (10 MW) current generation direct-drive WTGs and concluded that these designs could generate higher operational noise levels than those reported in earlier research. This

suggests that operational noise effects on sea turtles could be greater than those considered herein, but these findings have not been validated. The Project would generate operational noise throughout the life of the RWF. As noted previously, sea turtle hearing is largely within the frequency range (< 1,200 Hz) for operational wind turbines; therefore, it is possible that wind turbine noise could be heard by sea turtles, although behavioral responses are unlikely based on the established threshold.

Little is known currently about how sea turtles use hearing in their natural environment (Lavender et al. 2014); therefore, it is difficult to interpret the potential effects of long-term, non-impulsive noise generated by the WTGs. O'Hara and Wilcox (1990) reported that loggerheads avoid sources of low-frequency sound in the 25- to 1,000-Hz range. The sound levels produced during operation are less than the behavioral and injurious thresholds defined by NMFS for sea turtles. However, potential responses to underwater noise generated by WTG operation could include avoidance of the noise source. Operational noise levels would not cause injury to sea turtles but could alter the behavior of individuals close to the structure. Localized behavioral long-term effects from operational noise would be **negligible** adverse because of the limited likelihood of behavioral effects.

While sea turtles would likely be able to detect O&M vessels in the vicinity, this would not necessarily translate to biologically significant effects. For example, Hazel et al. (2007) concluded that sea turtles appear to be relatively insensitive to vessel noise, relying on their vision to detect approaching vessels. Sea turtles may respond to vessel approach and/or noise with a startle response (diving or swimming away) and a temporary stress response (NFS and USGS 2011). In contrast, Samuel et al. (2005) indicated that vessel noise can affect sea turtle behavior, especially their submergence patterns. BOEM anticipates that the potential effects of noise from O&M vessels would elicit brief responses to the passing vessel that would dissipate once the vessel or the turtle left the area. For these reasons, BOEM anticipates that sea turtle exposure to vessel noise would be minimal, and responses if any, would be temporary and biologically insignificant, with individuals returning to normal behaviors once the vessel has passed.

Up to 1,062 linear miles of postconstruction HRG surveys could be conducted each year for the first 4 years of Project operations to ensure transmission cables are maintaining desired burial depths. This equates to approximately 25 days of HRG survey activity per year. The related effects on sea turtles would be similar in nature to those described for construction-related HRG surveys in Section 3.19.2.2.1 but reduced in extent and duration. The limited behavioral responses to HRG survey equipment and vessels would be similar to those described above for general O&M vessel noise.

Project decommissioning would require the use of construction vessels of similar number and class as those used during construction. Underwater noise and disturbance levels generated during 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 not contribute to additional noise effects above and beyond those already considered for construction vessel noise. The short-term effects of Project decommissioning on sea turtles would therefore range from **negligible** to **minor** adverse.

<u>Presence of structures:</u> The WTG and OSS foundations, exposed portions of the offshore RWEC, and associated scour protection would result in a long-term conversion of existing complex and non-complex

bottom habitat to new stable, hard surfaces. Once construction is complete, these surfaces would be available for colonization by sessile organisms and would draw species that are typically attracted to hard-bottom habitat (Causon and Gill 2018; Langhamer 2012). Refer to Section 3.6.2.2.2, 3.6.2.3.2, and 3.13.2.2 for a detailed overview of potential changes in food web dynamics caused by reef effects. Over time, this reef effect would increase the amount of forage and shelter available for sea turtles.

The WTG and OSS foundations constitute potential obstacles in the water column for the life of the Project until decommissioning. Given that sea turtles are highly mobile and the structures are only 36 to 45 feet in diameter and would be separated by approximately 1 mile, the structural alterations of the water column are unlikely to pose a direct barrier to foraging, migration, or other behaviors of sea turtles. However, the presence of WTG structures could indirectly affect sea turtles by potentially altering prey distribution or promoting fish aggregations and thus concentrating fishing vessels at the foundations. This range of potential impacts is discussed in the following paragraphs.

Human-made structures, especially tall, vertical structures like WTG and OSS foundations, may also alter local water flow at a fine scale and could result in localized impacts on sea turtle prey distribution and abundance. These localized effects typically dissipate within a relatively short distance from the structure (Miles et al. 2017); effects would likely dissipate within 300 to 400 feet of each monopile foundation. However, there is potential for regional impacts to wind wave energy, mixing regimes, and upwelling (van Berkel et al. 2020), and these changes in water flow caused by the presence of the WTG structures could influence sea turtle prey distribution at a broader spatial scale. The distribution of fish, invertebrates, and other marine organisms on the OCS is determined by the seasonal mixing of warm surface and cold bottom waters, which determines the primary productivity of the system (Chen et al. 2018; Lentz 2017; Matte and Waldhauer 1984). While there is a high degree of uncertainty, the presence of WTG structures could affect conditions in ways that alter these dynamics, potentially increasing primary productivity in the vicinity of the structures by disrupting vertical stratification and bringing nutrient-rich waters to the surface (Carpenter et al. 2016; Schultze et al. 2020). However, this increase in primary productivity may not translate to a beneficial increase in sea turtle prey abundance if the increased productivity is consumed by filter feeders, such as mussels, that colonize the surface of the structures (Slavik et al. 2019). Considering the largely localized nature of potential effects to primary production surrounding WTGs (van Berkel et al. 2020), the likelihood of broader benefits for sea turtles is minimal.

The overall effects of offshore structure development on ocean productivity, sea turtle prey species, and, therefore, sea turtles, are difficult to predict with certainty and are expected to vary by location, season, and year, depending on broader ecosystem dynamics. The addition of up to 102 new offshore foundations 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). These aterations may increase foraging opportunities for loggerhead and Kemp's ridley sea turtles with preferences for more bottom-dwelling invertebrate prey. Increased primary and secondary productivity in proximity to structures could also increase the abundance of jellyfish, a prey species for leatherback sea turtles (English et al. 2017; NMFS and USFWS 1992). The artificial reefs created by these structures form biological hotspots that could support species range shifts and expansions and changes in biological community structure (Degraer et al. 2020; Methratta and Dardick 2019; Raoux et al. 2017). In contrast, broadscale hydrodynamic impacts could lead to localized changes in zooplankton distribution and abundance (van Berkel et al. 2020). As discussed in Section 3.6.2.3.2, hydrodynamic modeling conducted by Johnson et al. (2021) indicated project-related shifts in larval transport and settlement density, but these shifts are not expected to have broad-scale impacts on invertebrate populations. There is considerable uncertainty as to how these localized ecological changes would affect sea turtles and how those changes would interact with other human-caused impacts. The effect of these IPFs on sea turtles and their habitats could be positive or negative, varying by species, and their extent and magnitude is unknown. Recent studies have also found increased biomass for benthic fish and invertebrates, and possibly for pelagic fish, sea turtles, and birds, around offshore wind facilities (Pezy et al. 2018; Raoux et al. 2017; Wang et al. 2019), translating to potential increased foraging opportunities for sea turtle species. However, an increase in biomass could result in limited benefits to higher trophic levels, depending on species composition and prey preferences (Pezy et al. 2018).

Increased fish biomass around the structures could also attract commercial and recreational fishing activity, creating an elevated risk of injury or death from gear entanglement and ingestion of debris (Barreiros and Raykov 2014; Gregory 2009; Vegter et al. 2014). As noted above, lost/discarded fishing gear was associated with a majority of sea turtle entanglements in a global review (Duncan et al. 2017). However, through implementation of EPMs related to management of debris surrounding the WTGs (see Table FF-1 in Appendix FF), the increase in entanglement risk is expected to be minimal.

The presence of structures could result in multiple types of impacts, with potentially opposing outcomes for sea turtles. The presence of structures could indirectly concentrate recreational fishing around foundations, which could indirectly increase the potential for sea turtle ingestion of or entanglement in lines, nets, and other lost or discarded fishing gear (Gall and Thompson 2015; Nelms et al. 2016; Shigenaka et al. 2010). However, the addition of structures could benefit sea turtles by locally increasing pelagic productivity and prey availability for sea turtles. The overall impact to sea turtles is not expected to be biologically significant due to the patchy distribution of sea turtles in the northern portion of the GAA where the RWF and RWEC are located. Potential long-term, intermittent impacts could persist until decommissioning is complete and structures are removed. These impacts would be **negligible** to **minor** adverse, offset by **minor** beneficial impacts to sea turtle species that benefit from reef effects.

Decommissioning would remove the structures from the water column and effectively eliminate any operational effects of the presence of structures. No specific methods for decommissioning and removal of structures have been proposed, as the planned removal would occur at the end of the Project lifetime. The COP provides no indication that decommissioning would involve lines, rigging, or other equipment that could pose a potential entanglement risk to sea turtles. The Project would develop a decommissioning plan that specifies the methods and equipment proposed for structure removal. That plan would be subject to independent environmental compliance and regulatory review.

Vessel traffic: Revolution Wind (Tech Environmental 2021) has estimated that Project O&M would involve up to four CTV and two SOV trips per month for wind farm O&M, or 2,280 vessel trips over the life of the Project. These trips would originate either from an O&M facility located either in Montauk, New York, or Davisville, Rhode Island. One or more CTVs ranging from 62 to 95 feet in length would be purpose built to service the RWF over the life of the Project. SOVs are larger mobile work platforms, on the order of 215 to 305 feet long and 60 feet in beam, equipped with dynamic positioning systems used for more extensive, multiday maintenance activities (Ulstein 2021). Larger vessels similar to those used for construction could be required for unplanned maintenance, such as repairing scour protection or replacing damaged WTGs. Those activities would occur on an as-needed basis. Additional vessel trips would be required over the life of the Project forseafloor surveys and subsurface inspections. A minimum of three postconstruction seafloor bathymetry surveys would be conducted to assess foundation scour and correct if needed. Project fishery monitoring and benthic habitat monitoring surveys would also be conducted annually, as discussed above. Vessels used would be similar to those used for preconstruction HRG surveys.

In general, O&M-related vessel activities would represent a small increase in regional vessel traffic compared to existing conditions. Project O&M could involve up to 10 one-way vessel trips between the RWF and O&M facility or other area ports each month. By comparison, hundreds of large vessels and thousands of smaller vessels, many of the latter comparable in size to a CTV, travel through the areas between the wind farm and proposed O&M facility locations each month (Section 3.15.2.2.1). O&M vessel use would therefore represent a minimal increase in regional vessel traffic over the life of a facility and the effects to sea turtles are expected to be negligible adverse.

As detailed in Appendix F, all survey vessels would comply with speed restrictions and other minimization measures to minimize risk of collision with sea turtles, making the risk of vessel strikes from Project monitoring vessels unlikely. As described in the previous section, the applicant has voluntarily committed to specific EPMs, including vessel timing and speed restrictions, to avoid and minimize vessel-related risks to sea turtles (see Appendix F, Table F-1). Based on the generally low density of sea turtles in the Lease Area and the anticipated vessel trips during operations, there is a low risk of encountering a sea turtle. The operational conditions combined with planned EPMs (see Appendix F for all vessel strike avoidance measures) would minimize collision risk during construction and installation. During periods of low visibility, trained crew would use increased vigilance to avoid sea turtles. Because vessel strikes are not an anticipated outcome given the relatively low number of vessel trips and implementation of effective monitoring and EPMs. BOEM concludes vessel strikes have a low probability of occurrence and therefore would have a minor anticipated effect on sea turtles. In the unlikely event of a sea turtle strike by any vessel supporting the Project, Revolution Wind must immediately cease the activities until BOEM is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with all applicable laws (e.g., ESA) and COP approval conditions.

As with construction, a similar increase in vessel round trips during decommissioning is expected to increase the relative risk of vessel strike for sea turtles. The implementation of NOAA guidelines (see Appendix F) as an EPM is intended to minimize the potential of vessel strikes for sea turtles by reducing vessel speed and maintaining a separation distance from sighted turtles. Collisions, if they do occur, are expected to be fatal to individuals. Because the abundance of sea turtles in the RWF and RWEC is anticipated to be generally low with patchy distribution, and the proportional increase in vessel traffic is also low, the number of sea turtles injured or killed by vessel strikes as a result of Project decommissioning would be low and would have negligible effects at the population level. Therefore, potential effects of vessel strikes on sea turtles from vessels supporting Project decommissioning would be minor adverse. Overall, the anticipated effect to sea turtles from vessel traffic associated with O&M and decommissioning would be **negligible** to **minor** adverse.

Onshore Activities and Facilities

Onshore Project activities would not result in impacts to marine resources. Therefore, impacts to sea turtles from O&M and decommissioning of the Proposed Action would be the same as under the No Action Alternative: **negligible** adverse.

3.19.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Accidental releases and discharges: Toxic contaminants and marine debris are recognized as significant sources of sea turtle injury and mortality and are leading threats to successful species conservation and recovery. The Proposed Action would increase commercial vessel activity on the OCS, creating a potential source for accidental spills, trash, and debris. BOEM estimates that the Project would result in a negligible, up to 5% increase in total chemical usage in the GAA relative to the No Action Alternative. When combined with other offshore wind projects, up to approximately 19 million gallons of coolants, oils, fuels, and lubricants could cumulatively be stored within WTG foundations and the OSS within the GAA. Compliance with USCG regulations and BOEM requirements to minimize the risk of accidental spills and/or release of trash and debris would limit the volume and extent of Project-related trash/debris or invasive species potentially released accidentally. Additionally, as discussed in Section 3.19.1.1, the volumes of trash/debris potentially released accidentally under the No Action Alternative would be negligible and would not contribute to potential adverse impacts. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **negligible** to **minor** adverse because of the regulatory protections and limited likelihood of sea turtle exposure.

Climate change: The types of impacts from global climate change described for the No Action Alternative would occur under the Proposed Action, but the Proposed Action could also contribute to a long-term net decrease in GHG emissions. As described in Section 3.19.1.1, the interactions between climate change and other potential impacts associated with the Proposed Action are complex and difficult to predict with certainty. Northward shifts in sea turtle distributions due to warming waters could result in magnification of the anticipated impacts due to increased exposure. However, this magnification includes potential benefits associated with the creation of artificial reef habitat and could represent an increasing impact over the life of the Project. Based on the potential for increased exposure to the various effects of the Proposed Action described above, the Proposed Action when combined with other past, present, and reasonably foreseeable actions is expected to result in **minor** adverse cumulative impacts to sea turtles due to the anticipated shifts in distributions.

Noise: The Proposed Action would result in localized, temporary, negligible to minor impacts to sea turtles through the generation of impulsive and non-impulsive underwater noise associated with offshore wind construction activities. BOEM estimates a cumulative total of 3,110 offshore WTGs and OSS foundations could be developed in the GAA for sea turtles between 2022 and 2030. Sea turtles are anticipated to occur at generally low densities (see Section 3.19.1) near wind farms in the region, reducing the probability of individual exposure to noise effects. Noise sources associated with the Proposed Action could add to the ambient noise environment under the No Action Alternative if noise sources overlap temporally or geographically. Pile driving would represent the most significant source of noise. As noted in Section 3.19.1.1, there are three possible exposure scenarios for pile-driving noise:

1) concurrent exposure from two or more impact hammers for the same or adjacent projects; 2) non-concurrent exposure from multiple pile-driving events in the same years; 3) exposure to concurrent and non-concurrent pile-driving events over multiple years. Although the extent, duration, and magnitude of exposure would vary based on Project -specific factors, the effects would be similar in nature to those described for the Proposed Action. Although exposure to pile-driving noise could disrupt behaviors of individual sea turtles, it is not expected to impair essential behavioral patterns. This is due to the temporary, localized nature of the effects and because normal behaviors are expected to resume once the sea turtle is no longer exposed to the noise. Permanent hearing impairment could occur to some individuals, but science has not determined whether if changes in hearing ability would negatively impact the ability of sea turtles to feed, navigate, find suitable habitats, and reproduce. Due to the limited information about noise-related stress responses in sea turtles, physiological stress responses may likely occur concurrently with any other response, such as hearing impairment or behavioral disruptions.

For impulsive noise, BOEM anticipates that projects would employ soft starts during pile driving to allow the small number of turtles in the region to leave the area before underwater noise increases to injurious levels. Additionally, the implementation of sound attenuation systems, PSO monitoring and clearance zones, and other planned EPMs (see Appendix F) would further reduce the likelihood of injury from the potential moderate cumulative impacts associated with pile driving. Vibratory pile driving associated with the sea-to-shore transition would create non-impulsive underwater noise, but similar to the effects of the impulsive impact hammer, only minor impacts to sea turtles are expected because of the combination of minimization measures used and the low densities of sea turtles in the RWF and RWEC. Potential behavioral effects are more likely to be related to vessel noise and disturbance than the vibratory pile driving itself.

With regard to other non-impulsive noise sources, potential behavioral impacts on sea turtles from vessel traffic noise would be intermittent and temporary as animals and vessels pass near each other. During construction and operation, helicopter traffic could cause some temporary behavioral reactions in sea turtles, but energy expenditures would be minimal.

Based on the above findings, noise-related impacts of the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts to sea turtles, depending upon the noise source.

<u>Presence of structures</u>: The Proposed Action would result in long-term negligible and minor beneficial impacts to sea turtles through the installation of 102 structures (100 WTGs and two OSSs) to conditions under the No Action Alternative. The installation of monopile foundations would alter the character of the ocean environment, and their presence could affect sea turtle behavior. Increased prey availability, attraction to structures, and/or displacement could occur as a result of the installation of WTG facilities. As described in Section 3.19.2.2.2, structures associated with offshore wind farms are expected to provide some level of reef effect and could benefit sea turtle foraging by creating new hard-bottom habitat, increasing pelagic productivity in local areas, or promoting prey aggregations on foundations.

Some level of displacement of sea turtles out of the Lease Area and into areas with a higher potential for interactions with ships or recreational or commercial fishing gear could occur, particularly during construction phases, when elevated underwater noise levels occur. These intermittent impacts would persist until decommissioning is complete and structures are removed. Impacts could occur as a result of increased interaction with fishing gear, although annual monitoring, reporting, and cleanup of fishing gear around the base of the WTGs would reduce the extent of these impacts.

BOEM estimates a cumulative total of 3,110 offshore WTGs and OSS foundations for the Proposed Action plus all other future offshore wind projects in the GAA. For similar reasons as described above, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse cumulative impacts and potential **minor** beneficial cumulative impacts to sea turtles.

Vessel traffic: The Proposed Action would result in minor impacts to sea turtles through the addition of construction and maintenance vessels within the GAA. This increased offshore wind-related vessel traffic during construction, and associated noise impacts, could result in localized, intermittent impacts on sea turtles, resulting in brief minor behavioral responses that would be expected to dissipate once the vessel or the individual has left the area. However, BOEM expects that these brief responses of individuals to passing vessels would be unexpected given the patchy distribution of sea turtles; no stock- or population-level effects would be expected. Additionally, the Proposed Action would implement EPMs (see Table F-1 in Appendix F) to minimize vessel strikes.

BOEM estimates a peak of 380 vessels supporting offshore wind development will be operating in the GAA over the next decade, of which up to 61 would be associated with the Proposed Action construction and six would be associated with O&M. This increase in vessel traffic poses an increased likelihood of collision-related injury and mortality relative to existing baseline conditions. Some sea turtlescould be injured or killed as a result, but the number of individuals impacted is not likely to significantly increase the existing mortality rate from vessel strikes. Additionally, BOEM expects that similar EPMs will be included in future offshore wind projects, helping to minimize the vessel strike risk. Therefore, cumulative impacts associated with the Project when combined with past, present, and reasonably foreseeable future activities would be **minor** adverse; however, BOEM does not expect the viability of sea turtle populations to be affected.

Onshore Activities and Facilities

Onshore Project activities would not result in impacts to marine resources. Therefore, cumulative impacts to sea turtles from onshore activities associated with all past, planned, and reasonably foreseeable future activities would be the same as under the No Action Alternative: **negligible** adverse.

3.19.2.2.4 Conclusions

Project construction and installation, O&M, and decommissioning would impact sea turtles through exposure to vessel traffic, underwater noise impacts, temporary habitat disturbance, and long-term habitat conversion. Individual sea turtles could be injured or killed by vessel collisions and underwater noise exposure during ProjectP construction, but the exposure risk is low and the number of individuals impacted would likely be small. Temporary habitat disturbance, including alteration of the seafloor and suspended sediment and burial effects, would be limited in extent and well below levels likely to have biologically significant effects on any sea turtle species. Reef effects created by the presence of offshore wind structures could beneficially increase foraging opportunities for species, such as loggerhead sea turtles, that forage on benthic crustaceans and other invertebrates.

On this basis, BOEM anticipates that the Proposed Action would result in **negligible** adverse to **minor** impacts to sea turtles, including **minor** beneficial impacts for species that are able to exploit the increased biological productivity created by reef effects on offshore wind structures. Overall, the impacts of the Proposed Action alone on sea turtles would likely be **minor** beneficial to **minor** adverse. Although some of the proposed activities and/or IPFs analyzed could overlap, BOEM does not anticipate that these combined effects would alter the overall significance determination because they would not alter impacts on any species to such a degree that measurable population-level effects would occur.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from negligible to minor adverse and minor beneficial for some sea turtle species. The impact-level criteria are used to characterize effects of all IPFs. Applying these criteria, 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 impacts on sea turtles in the GAA because unavoidable adverse impacts on individual sea turtles could occur that coincide with other adverse effects resulting from climate change, but those impacts are unlikely to measurably affect the viability of any sea turtle species at the population level.

3.19.2.3 Alternatives C, D, E, and F

3.19.2.3.1 Construction and Installation

Offshore Activities and Facilities

Noise: Construction of Alternatives C through F would result in similar underwater noise impacts on sea turtles from foundation installation to those described for the Proposed Action in Section 3.19.2.2.1, but those impacts would be reduced in extent and duration because fewer structures would be installed. This would reduce the number of days of impact pile driving required to construct the Project and the associated extent and duration of underwater noise. Reducing the number of structures could also reduce the required extent of HRG surveys under each alternative relative to the Proposed Action, but BOEM has insufficient information to determine if this is the case. The potential distribution of UXOs within the RWF is not currently known, but the largest devices are most likely to be encountered within the central portion of the RWF and in state waters on the RWEC corridor at the mouth of and outside of Narragansett Bay (Ordtek 2021). The RWEC configuration would remain the same across all alternatives, and the probable area of occurrence within the RWF is sufficiently large that it is not possible to determine how changes in alternative configuration would affect the likelihood of UXO encounters. Therefore, impacts to sea turtles from HRG surveys and UXO detonation are considered to be the same across all alternatives.

Differences in the extent and duration for the Proposed Action and the different configurations proposed for Alternatives C through E are summarized in Tables 3.19-5, 3.19-6, and 3.19-7, respectively, based on the total number of WTG and OSS foundations requiring pile driving and underwater noise injury and behavioral effects thresholds. These tables display the number of structures installed and estimated days of pile-driving activity required to construct each alternative. As shown, while the extent and duration of potential noise exposure from impact pile-driving activities would vary between layouts, these effects would be similar in magnitude and general scale to the Proposed Action. Therefore, noise effects on sea turtles from the construction phase of each alternative would likewise vary by species and range from **negligible** to **minor** adverse. The potential use of larger capacity WTGs under Alternative F could result in more extensive operational noise impacts than the Proposed Action, but insufficient information is available to characterize differences in effect.

Table 3.19-5. Comparison of Maximum Underwater Noise Injury and Behavioral Effects Exposure Extent and Duration (number of sites/days) to Sea Turtles from Revolution Wind Farm Foundation Installation for the Proposed Action and Proposed Configurations for the Habitat Alternative*

Exposure Type	Threshold Distance (feet)†	Proposed Action	C1	C2
Peak injury	–	100 sites/ 35 days	64 sites/ 22 days	65 sites/ 22 days
Cumulative injury	98–689			
Behavioral or TTS	1,903–2,920			

* Installation scenario for 12-m monopile is 6,500 strikes/pile at installation rate of three piles/day. All piles installed with a 4,000-kJ hammer with an attenuation system achieving 10 dB sound source reduction.

† Threshold distances are the distance in feet from the sound source where the identified type of exposure could occur. WTG values are the range threshold distances for monopile installation modeled by Kusel et al. (2021) across modeled sites and seasonal conditions.

Table 3.19-6. Comparison of Maximum Underwater Noise Injury and Behavioral Effects Exposure Extent and Duration (number of sites/days) for Sea Turtles from Revolution Wind Farm Foundation Installation for the Proposed Action and Proposed Configurations for the Transit Alternative*

Exposure Type	Threshold Distance (feet)[†]	Proposed Action	D1	D1+D2	D1+D2+D3	D1+D3	D2	D2+D3	D3
Peak injury	–	100 sites/ 35 days	93 sites/ 31 days	92 sites/ 31 days	93 sites/ 31 days	85 sites/ 28 days	86 sites/ 29 days	85 sites/ 28 days	78 sites/ 26 days
Cumulative injury	98–689								
Behavioral	1,903–2,920								

* Installation scenario for 12-m monopile is 6,500 strikes/pile at installation rate of three piles/day. All piles installed with a 4,000-kJ hammer with an attenuation system achieving 10 dB sound source reduction.

† Threshold distances are the distance in feet from the sound source where the identified type of exposure could occur. WTG values are the range threshold distances for monopile installation modeled by Kusel et al. (2021) across modeled sites and seasonal conditions.

Table 3.19-7. Comparison of Maximum Underwater Noise Injury and Behavioral Effects Exposure Extent and Duration (number of sites/days) for Sea Turtles from Revolution Wind Farm Foundation Installation for the Proposed Action and Proposed Configurations for the Viewshed Alternative*

Exposure Type	Threshold Distance (feet)[†]	Proposed Action	E1	E2
Peak injury	–	100 sites/5 days	64 sites/21 days	81 sites/27 days
Cumulative injury	98–689			
Behavioral	1,903–2,920			

* Installation scenario for 12-m monopile is 6,500 strikes/pile at installation rate of three piles/day. All piles installed with a 4,000-kJ hammer with an attenuation system achieving 10 dB sound source reduction.

† Threshold distances are the distance in feet from the sound source where the identified type of exposure could occur. WTG values are the range threshold distances for monopile installation modeled by Kusel et al. (2021) across modeled sites and seasonal conditions.

<u>Presence of structures:</u> The presence of WTG and OSS monopile foundations associated with Alternatives C through F would result in similar impacts to sea turtles as those described for the Proposed Action in Section 3.19.2.2.2, but those impacts would be reduced in extent and would vary depending on the alternative selected. Refer to the tables in Section 3.6.2.4.2 for a summary of the number of structures proposed by alternative and configuration. Impacts of the presence of structures are expected to be relative to the total number of structures proposed (i.e., fewer structures would result in a smaller extent of impacts).

As with the Proposed Action, the overall impact to sea turtles from the presence of structures is not expected to be biologically significant due to the patchy distribution of sea turtles within the RWF and RWEC. Impacts from the presence of structures are expected to vary in relation to the total number of foundations proposed (i.e., fewer structures would result in less extensive impacts). For example, both configurations of Alternative C and Alternative E1 propose noticeably fewer WTG and OSS foundations compared to the Proposed Action and most configurations of Alternative D. Therefore, these alternatives would be expected to produce noticeably reduced impacts from this IPF by comparison. In general, presence of structures effects on sea turtles under Alternatives C through F would likely be less extensive compared to those resulting from the Proposed Action. Reef effects would be reduced commensurate with the number of foundations constructed under each alternative configuration.

At present, insufficient information is available to determine if differences in Project configuration between alternatives, specifically where foundations are located relative to sensitive benthic habitats, would contribute to a measurable difference in reef effects on sea turtles beyond those resulting from a simple reduction in the number of structures. As stated in Section 3.15.2.2.3, hydrodynamic effects are likely to lead to localized changes in the distribution of planktonic organisms (e.g., jellyfish) for certain sea turtle species, but shifts in prey distribution on the order of miles to tens of miles are unlikely to be biologically significant for species that migrate thousands of miles between seasonal habitats every year. Increased biological productivity resulting from reef effects could concentrate recreational fishing around foundations, which could theoretically increase the potential for harmful interactions with fishing gear. However, these reef effects would also benefit certain sea turtle species by increasing and concentrating prey availability. Therefore, while Alternatives C through F would likely alter and reduce the extent of measurable reef and hydrodynamic effects relative to the Proposed Action, those effects are likely to remain biologically insignificant. Potential long-term intermittent impacts would persist until decommissioning is complete and structures are removed. These impacts would also be **negligible** to **minor** adverse, offset by **minor** beneficial impacts to sea turtle species that benefit from reef effects.

3.19.2.3.2 Conclusions

The construction and installation, O&M, and decommissioning of Alternatives C through F would impact sea turtles through the same IPFs described for 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 EPM’s as described in the Proposed Action (see Table F-1 in Appendix F). Alternatives C through F 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. However, the overall reduction in impacts would not be sufficient to alter the impact determinations for any sea turtle species. On this basis, BOEM concludes that Alternatives C through F would result in **minor** adverse effects to sea turtles, with those effects partially offset by **minor** beneficial impacts for some sea turtle species.

3.19.2.4 Mitigation

Additional mitigation measures identified by BOEM and cooperating agencies are described in detail in Appendix F, Table F-2 and below (Table 3.19-8).

Table 3.19-8. Proposed Mitigation Measures – Sea Turtles

Mitigation Measure	Description	Effect
Marine debris	Appropriate actions (e.g., training, marking, reporting) would be taken to minimize the potential for the introduction of trash and debris to the marine environment.	This measure would complement existing EPMs and regulatory requirements, ensuring that impacts from the accidental releases and discharges IPF would remain negligible adverse.
Sound field verification	Revolution Wind will develop a sound field verification plan and submit it to BOEM, the USACE, and NMFS for review and written approval at least 90 days prior to initiating underwater noise-producing construction activities. The sound field verification would provide the basis for established pre-start clearance and shutdown zones.	This measure would not modify the impact determination for noise effects on sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Passive acoustic monitoring	Revolution Wind will prepare a PAM plan to record ambient noise and vocalizations in the Lease Area. Acoustic monitoring will be implemented prior to and throughout the construction period and will continue for at least 2 years of Project operations after construction is complete. The total number of PAM stations and array configuration will depend on the size of the zone to be monitored, the amount of noise expected in the area, and the characteristics of the signals being monitored to accomplish both monitoring during construction and meet postconstruction monitoring needs. Underwater acoustic monitoring will use standardized measurement methods and data processing and visualization metrics developed for the Atlantic Deepwater Ecosystem Observatory Network for the U.S. Mid- and South Atlantic OCS (see https://adeon.unh.edu). At least two PAM buoys will be independently deployed within or bordering the RWF Lease Area, or one or more buoys will be deployed in coordination with other acoustic monitoring efforts in the RI and MA lease areas.	This measure would not modify the impact determination for construction and operational noise effects on sea turtles but would improve understanding of these impacts on specific resources and inform future management and mitigation measures.
PSO coverage	BOEM, BSEE, and the USACE would ensure that PSO coverage is sufficient to reliably detect sea turtles	This measure would not modify impact determinations on sea

Mitigation Measure	Description	Effect
	at the surface in clearance and shutdown zones to execute any pile-driving delays or shutdown requirements.	turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Pile-driving monitoring	Revolution Wind will prepare a pile driving monitoring plan in coordination with the PAM plan. PAM data would be used to determine potential marine mammal presence in the vicinity of project activities. RWF will provide sufficient protected species observer (PSO) coverage to reliably detect marine mammals within established clearance and shutdown zones. PSOs must have effective visual monitoring of all clearance zones in all directions prior to the commencement of pile driving.	This measure would not modify the impact determination for noise effects on sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Shutdown zone and clearance zone adjustment	BOEM, BSEE, and NMFS may consider reduction adjustments in the pre-start clearance and/or shutdown zones based on the initial sound field verification measurements. If initial measurements indicate distances to sea turtles are greater than predicted by modeling assuming 10 dB attenuation, Revolution Wind will implement additional sound attenuation measures prior to conducting additional pile driving.	This measure would not modify the impact determination for noise effects on sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Monitoring zones for sea turtles	BOEM, BSEE, and the USACE would ensure that Revolution Wind monitors the full extent of the area where noise would exceed the 175 dB re 1 μPa^2 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.	This measure would not modify the impact determination for noise effects on sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Vessel strike avoidance measures for sea turtles	Between June 1 and November 30, Revolution Wind would have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles.	This measure comprises a set of requirements to review current sea turtle sighting information in the region, to maintain constant watch over a 500-meter vessel strike awareness zone during vessel transits, and to slow vessels to a speed of 4 knots or less when sea turtles are observed or likely to be present based on observed concentrations of prey. This measure would complement existing EPMs and ensure their effectiveness. While it would not modify the impact determination for vessel-related effects on sea

Mitigation Measure	Description	Effect
		turtles, it would help to ensure that these effects do not exceed the levels analyzed herein.
Vessel communication	Visual observations of marine mammals will be communicated to all Project vessels to coordinate implementation of related EPMs and mitigation measures.	This measure would complement existing EPMs and ensure their effectiveness. While it would not modify the impact determination for vessel-related effects on sea turtles, it would help to ensure that these effects do not exceed the levels analyzed herein.
Vessel speed restriction	All vessels, regardless of size, would comply with a 10-knot speed restriction in any SMA, DMA, or Slow Zone.	This measure would complement existing EPMs and ensure their effectiveness. While it would not modify the impact determination for vessel-related displacement effects on marine mammals, it would help to ensure that these effects do not exceed the levels analyzed herein.
Gear management	Sampling or survey gear would be regularly maintained and monitored to limit the potential for entanglement. Gear would be uniquely marked, and all reasonable efforts would be undertaken to recover lost gear.	This measure would complement existing EPMs and ensure that entanglement risk associated with survey activities and potential impacts on sea turtles remain negligible.
Sea turtle disentanglement	Vessels deploying fixed gear (e.g., pots/traps) would have adequate disentanglement equipment (i.e., knife and boathook) onboard. Any disentanglement would occur consistent with the Northeast Atlantic Coast Sea Turtle Disentanglement Network Guidelines.	This measure would complement existing EPMs and ensure that entanglement risk associated with fixed gear and potential impacts on sea turtles remains negligible.
Sea turtle data	Any sea turtles caught and/or retrieved in survey gear would be identified to species or species group, properly documented, and data collected, then live, uninjured animals would be returned to the water as quickly as possible after completing the required handling and documentation.	This measure would not modify the impact determination for sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Sea turtle handling	Atlantic sturgeon caught and/or retrieved in survey gear would be handled and resuscitated (if unresponsive) according to established protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s) to do so.	This measure would not modify the impact determination for sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.

Mitigation Measure	**Description**	**Effect**
Take notification	GARFO PRD would be notified as soon as possible of all observed takes of Atlantic sturgeon occurring as a result of any fisheries survey.	This measure would not modify the impact determination for sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.
Reporting	BOEM and BSEE would ensure that Revolution Wind submits regular (e.g., monthly) reports to document the amount of extent of take that occurs during all phases of the Proposed Action.	This measure would not modify the impact determination for any IPF but would contribute to improved understanding of marine mammal use of the RWF and vicinity.
Data collection	BOEM and BSEE would ensure that all Project design criteria and BMPs incorporated in the Atlantic data collection consultation for offshore wind activities (Baker and Howson 2021) shall be applied to activities associated with the construction, maintenance and operations of the Revolution Wind Project as applicable.	This measure would not modify the impact determination for sea turtles but would provide the information necessary to ensure that these effects do not exceed the levels analyzed herein.

3.20 Visual Resources (see section in main EIS)

3.21 Water Quality

3.21.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Water Quality

3.21.1.1 Offshore Water Quality

Geographic analysis area: The GAA for offshore water quality impacts comprises coastal and marine waters within 10 miles of Project components and within 15.5 miles of waterways for ports that could be used during the Project (Figure 3.21-1). This analysis area was chosen by analyzing a worst-case scenario of an incidental oil discharge under the Project, which would equate to the simultaneous release of all oils used by all Project components and vessels.

Affected environment: Offshore waters in the offshore water quality analysis area comprise coastal waters (e.g., ports and harbors, bays, and estuaries; marine waters) located within the state territory (within 3 nm of shore) and within federal waters. The coastal waters, including the Long Island Sound, Block Island Sound, Rhode Island Sound, Narragansett Bay, and Atlantic Ocean, are located offshore and include existing port facilities in New York, Connecticut, Rhode Island, Virginia, Massachusetts, Maryland, and New Jersey that could be used for the Project. Because of their highly seasonal variations in temperature, stratification, and productivity, marine waters are considered temperate. Water currents near the shoreline of the landing site flow predominantly southwest and northeast, and water currents in the northern and southeastern portions of the offshore portion of the Lease Area flow predominantly south and east (RPS 2021). Along the proposed RWEC, currents were measured up to approximately 0.2 m/s, which increased to approximately 0.4 m/s at Narragansett Bay (RPS 2021).

Near the Lease Area, NOAA reported annual increases in relative sea level trends at seven tide stations (NOAA 2021a, 2021b, 2021c, 2021d, 2021e, 2021f, 2021g), including four along the Long Island coast (Bridgeport, Port Jefferson, New London, and Montauk), two along the Rhode Island coast (Newport and Providence), and one along the Massachusetts coast (Woods Hole) with increases ranging from approximately 2.4 millimeters per year at Providence, Rhode Island, to 3.41 millimeters per year at Montauk, New York. These increasing sea levels in addition to storm surges that are increasing in both frequency and magnitude have contributed to coastal erosion that has led to eroded shorelines and increased susceptibility to flooding (New York Sea Grant 2018; Rhode Island Coastal Resources Management Council 2014).

Offshore water quality is characterized by dissolved oxygen (DO), chlorophyll *a*, nutrients (phosphorus and nitrogen), pathogens, contaminants (metals, polychlorinated biphenyls [PCBs], and organic and inorganic pollutants), turbidity, and point and nonpoint source pollution. These parameters, which are described in COP Section 4.2.2 (vhb 2022), influence coastal and marine environments and are indicators of ecosystem health. In general, salinity levels in the region have low variability. Salinity ranged from 23.7 to 28.4 practical salinity unit (psu) in Narragansett Bay from 2005 through 2015, as well as 32 to 33 psu in the broader New England lease area between 1980 and 2007 (BOEM 2021a).

As described in COP Section 4.2.4 (vhb 2022), surface water temperatures fluctuate up to 59 degrees Fahrenheit (°F) seasonally, with bottom waters experiencing smaller seasonal temperature fluctuations of approximately 41°F. Water temperatures are highest in July and August when the water column becomes stratified; RWF surface water temperatures are close to 68°F, while bottom waters are approximately

50°F. During the winter, average surface water temperatures range from approximately 39°F to 41°F, with bottom waters staying slightly warmer at the southern edge of Rhode Island Sound.

The Project, including offshore facilities and ports, would be located within the northeast and mid-Atlantic regions of the United States, as defined by the EPA (2012). Overall water quality along the Atlantic coast has been rated “fair” to “good” (EPA 2012). The Mid-Atlantic region’s water quality has been rated as generally “good,” and the northeast region’s water quality has been rated “fair” (EPA 2012). Water quality in the Long Island Sound from the Port Jefferson area eastward has generally improved or remained “very good” over the past decade (University of Maryland 2018). In general, water quality improves north to south from Narragansett Bay to the OCS (EPA 2012). Seventy percent of Rhode Island coastal waters are categorized as Type 1 (i.e., waters abut shorelines in natural undisturbed conditions) and Type 2 (i.e., waters are adjacent to predominantly residential areas; docks are allowed but other more intensive uses are not) (Rhode Island Division of Planning 2016). The water quality of estuarine waters off the coast of Rhode Island, including Narragansett Bay and nearby coastal ponds, has experienced degradation from nutrients and stormwater runoff carrying contaminants, although overall water quality in the area is generally good (Rhode Island Division of Planning 2016).

DO concentrations for offshore waters along the Atlantic coast and in the northeast region have been rated as generally “fair” (EPA 2012). DO concentrations have been rated as “good” within the Mid-Atlantic region (EPA 2012). Low DO concentrations have been measured at Long Island Sound monitoring stations (EPA 2012); however, water quality surveys at stations in the Rhode Island Sound revealed DO concentrations in surface and bottom waters above established levels for the “highest quality marine waters” (RI CRMC 2010). The upper reaches of Narragansett Bay and urbanized tidal rivers and embayments have been more heavily impacted by urbanized areas, which has led to continued water quality degradation, including low DO levels from excess nutrient (nitrogen) runoff (Rhode Island Division of Planning 2016). Chlorophyll *a* concentrations in samples from Rhode Island Sound and Block Island Sound were variable but representative of oceanic systems and comparable to each other and other coastal systems (RI CRMC 2010; RPS 2021). In Narragansett Bay, chlorophyll *a* concentrations were slightly higher compared to the overall northeast coast region (RI CRMC 2010; vhb 2022).

Pathogens and nutrients, which are transported from point and nonpoint sources of pollution to coastal waters through stormwater and wastewater discharges (RI CRMC 2016), are the most prevalent pollutants degrading water quality in Rhode Island (Rhode Island Division of Planning 2016). There have been no documented reports of harmful algal blooms or waterborne pathogen outbreaks in the Block Island Sound or Rhode Island Sound (EPA 2012; RI CRMC 2010); however, excess nutrients (nitrogen) in Narragansett Bay have led to oxygen depletion events (hypoxia and anoxia) that have degraded water quality conditions (EPA 2012; Rhode Island Division of Planning 2016). Dissolved nutrients from Narragansett Bay, in addition to those from Long Island Sound, reach OCS waters and contribute to degraded water quality conditions (vhb 2022). Nutrient levels in Rhode Island waters have decreased over the past 15 years (RI CRMC 2016; vhb 2022), and Rhode Island’s southern shoreline waters have overall remained acceptable for both swimming and shellfishing (Rhode Island Division of Planning 2016). Dissolved inorganic phosphorus (a form of phosphorus in fertilizers) concentrations at monitoring stations in the Long Island Sound and Narragansett Bay were rated as “poor” (0.05–0.20 milligram per liter) (EPA 2012).

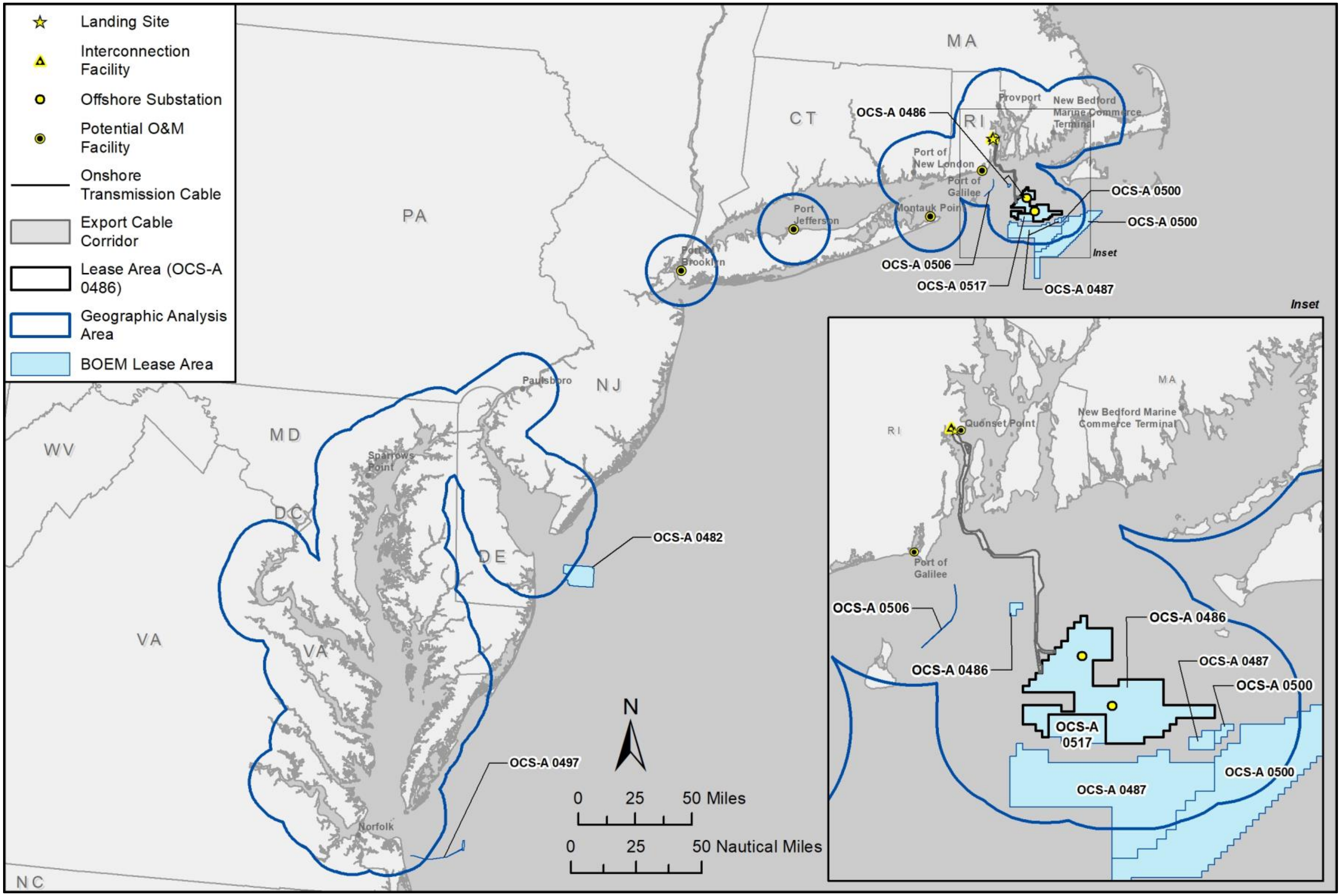

Figure 3.21-1. Geographic analysis area for offshore water quality.

Data are limited for water-column contaminant levels. In the Rhode Island Sound, organic contaminants were below detectable limits (USACE 2004; vhb 2022). Higher concentrations of heavy metals and PCBs have been identified in the northern reaches of Narragansett Bay compared to lower reaches (vhb 2022). Past investigations in and around the analysis area have not identified metal, PCB, or organic and inorganic pollutant concentrations above ambient water quality criteria (RI CRMC 2010). Contaminants could also reside within the sediment column and contribute to water quality conditions if disturbed. The Narragansett Bay is rated as “poor” for sediment toxicity (EPA 2012).

Turbidity is influenced by currents and storms, which lead to the resuspension of clay, silt, and fine-grained sand that comprise the sediment. Federal marine waters typically have very low concentrations of total suspended solids. Past investigations in the Rhode Island Sound revealed a range of turbidity levels from 0.1 to 7.4 milligram per liter of total suspended solids (USACE 2004; vhb 2022). Within the Narragansett Bay, annual average visibility depth in 2017–2019 ranged from 1.7 to 2.3 meters. See COP Section 4.2 (vhb 2022) for additional information regarding physical oceanographic and meteorological conditions within the analysis area.

3.21.1.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential offshore water quality impacts associated with future offshore wind development. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

<u>Accidental releases and discharges:</u> Future offshore wind activities could contribute to changes in offshore water quality from a spill or release during routine vessel or equipment use, a spill at an offshore wind facility, a spill during construction and installation due to a vessel allision or collision, or the accidental discharge of trash and debris.

Numerous offshore wind projects could occur with overlapping construction schedules between 2022 and 2032 (see Appendix E). This EIS estimates that up to approximately 1.8 million gallons of coolants, fuels, oils, and lubricants could be stored within WTG foundations and the OSS within the offshore water quality GAA. Other chemicals, including grease, paints, and sulfur hexafluoride, would also be used at the offshore wind projects. BOEM anticipates that the likelihood of a major spill of these chemicals during construction due to vessel allisions, collisions, O&M activities, or weather events is very low (once per 1,000 years) (Bejarano et al. 2013). All future offshore wind projects would be required to comply with regulatory requirements related to the prevention and control of accidental spills administered by the USCG and BSEE. OSRPs are required for each project and would provide for rapid spill response, cleanup, and other measures that would help to minimize potential impacts on affected resources from spills. WTGs and OSSs are generally self-contained and would not generate discharge (see COP Appendix D). Vessels would also have onboard containment measures that would further reduce the impact of a spill in the event of an allision or collision.

A release during construction or operations of offshore wind projects would generally be classified as “routine” and minor adverse because of the size of the release (i.e., spills less than 10 barrels, or 420 gallons) and its rapid dispersion (BOEM 2015). Routine spills would result in little change to water quality and would therefore be localized, short term, and **minor** adverse. In the unlikely event an allision or collision involving Project vessels or components resulted in a large spill, impacts on water quality would be **minor** to **moderate** adverse, and would range from short term to long term, depending on the type and volume of material released, the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill, and effectiveness of the cleanup techniques deployed.

Vessel operators would be required to comply with federal and international requirements for the management of shipboard trash and the USCG ballast water management requirements outlined in 33 CFR 151 and 46 CFR 162. Accidental releases of trash and debris would be infrequent and **negligible** adverse, and any allowed vessel discharges, such as bilge and ballast water, would be restricted to uncontaminated or appropriately treated liquids.

Anchoring and new cable emplacement/maintenance: Offshore wind activities would contribute to changes in offshore water quality from resuspension and deposition of sediments during anchoring. BOEM estimates that approximately 698 acres of seafloor could be impacted by anchoring under the No Action Alternative within the offshore water quality GAA. Disturbances to the seafloor during anchoring would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to the anchorage area. Currents and storms currently contribute to turbidity throughout the water column from the resuspension of clay, silt, and fine-grained sand making up the sediment. As a result, adverse impacts on offshore water quality under the No Action Alternative would be **minor** adverse and temporary.

BOEM estimates that approximately 3,134 acres of seafloor could be impacted by cable placement under the No Action Alternative within the offshore water quality GAA due to reasonably foreseeable offshore wind development. Similar to anchoring, these activities would contribute to changes in offshore water quality from the resuspension and deposition of sediment. Sediment suspension and deposition from offshore wind projects would be limited in terms of extent and duration.

BOEM anticipates that future offshore wind projects would use dredging only when necessary and would rely on other cable laying methods for reduced impacts (such as jet plow or mechanical plow) where feasible. Furthermore, these impacts from individual projects would not be expected to overlap with one another spatially or temporally. For these reasons, sediment suspension associated with other wind projects would be localized, **minor** adverse, and temporary.

Port utilization: Offshore wind development would use nearby ports as described in Chapter 2 and could also require port expansion or modification, resulting in increased vessel traffic or increased suspension and turbidity from in-water work. These activities could also increase the risk of accidental spills or discharges. However, these actions would be localized, and port improvements would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on offshore water quality under the No Action Alternative would be short term to long term **minor** adverse.

Presence of structures: Reasonably foreseeable offshore wind projects are estimated to result in no more than 205 structures by 2030 within the offshore water quality GAA. These structures could disturb up to 201 acres of seafloor within the water quality GAA from foundation and scour protection installation and disrupt bottom current patterns, leading to increased movement, suspension, and deposition of sediments. Scouring, which could lead to impacts on water quality through the formation of sediment plumes (Harris et al. 2011), would generally occur in shallow areas with tidally dominated currents. Structures could reduce wind-forced mixing of surface waters, whereas water flowing around the foundations could increase vertical mixing (Carpenter et al. 2016; Cazenave et al. 2016). Results from a recent BOEM (2021b) hydrodynamic model of four different WTG build-out scenarios of the offshore RI/MA WEA found that offshore wind projects could alter local and regional physical oceanic processes (e.g., currents, temperature stratification) through their influence on currents from WTG foundations and by extracting energy from the wind. The results of the hydrodynamic model study show that the introduction of offshore wind structures into the offshore area 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 OSW turbines. Alterations in currents and mixing would affect water quality, including DO, but would vary seasonally and regionally. WTGs and OSSs associated with reasonably foreseeable offshore wind projects would be placed in average water depths of 100 to 200 feet where current speeds are relatively low, and offshore cables would be buried where possible. Cable armoring would be used where burial is not possible, such as in hard-bottomed areas. BOEM anticipates that developers would implement best management practices to minimize seafloor disturbance from foundations, scour, and cable installation. As a result, impacts on offshore water quality under the No Action Alternative would be localized, short term, and **minor** adverse.

The exposure of offshore wind structures, which are mainly made of steel, to the marine environment can result in corrosion to the structures 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/or leaching. The current understanding of chemical emissions for offshore wind structures is that emissions appear to be low, suggesting a low environmental impact, especially if compared to other offshore activities, but these 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).

3.21.1.1.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts to offshore water quality associated with the Project would not occur. However, ongoing and future activities would have continuing temporary to long-term impacts on water quality from offshore spills or discharge, resuspension and deposition of sediments, scouring, or changes to current patterns and mixing.

BOEM anticipates that the range of impacts for reasonably foreseeable offshore wind activities would be minor to moderate adverse due to short-term erosion and sedimentation, discharges, and dispersal of contaminants during routine spills. As described in Appendix E1, BOEM anticipates that the range of impacts for ongoing activities and reasonably foreseeable offshore activities other than offshore wind would be minor to moderate adverse due to temporary or short-term disturbance to sediments during construction activities.

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 **minor** adverse impacts because the effects would be small and the resource would recover completely.

3.21.1.2 Onshore Water Quality

Geographic analysis area: The GAA for onshore water quality impacts comprises the watersheds and groundwater basins that cross or fall within the Lease Area (Figure 3.21-2). This analysis area was chosen to capture the extent of the natural network of waterbodies that could be affected by construction and operations activities of the Project.

Affected environment: The onshore analysis area for surface water encompasses the Lower West Passage subwatershed (Hydrologic Unit Code 010900040908), where all Project components would be located (see Figure 3.21-2). The Lower West Passage subwatershed includes more than 500 surface water features (U.S. Geological Survey 2004). The Project's onshore facilities would not cross surface waterbodies. The nearest surface water features to the Lease Area that would contribute to flows to and from the Lease Area include 10 perennial streams/rivers, three artificial paths, 16 swamps/marshes, and 12 perennial lakes/ponds. These waterbodies, which are identified in Figure 3.21-2, would have the greatest influence on or from the Project and are therefore the focus of this analysis of onshore water quality impacts.

Surface water quality within the onshore water quality analysis area is generally good. None of the surface waterbodies near the Lease Area are currently listed as impaired (Rhode Island DEM 2021a). There is only one named waterbody—Mill Creek—near the Lease Area. Mill Creek, including its tributaries, is designated as Class B (Rhode Island DEM 2021b), which includes waters that are designated for fish and wildlife habitat and primary and secondary contact recreational activities (250 RICR 150.05 (Rhode Island Department of State 2018).

Groundwater resources are limited in the analysis area. The Project would be located (at its closest point) approximately 0.1 mile west of the Conanicut Island Aquifer, which is a sole source aquifer (URI Environmental Data Center and Rhode Island GIS 2016a). At its nearest points, the Project would be located approximately 1.2 miles east of the nearest groundwater recharge area and 2 miles east of the Pettaquamscutt groundwater reservoir, which is classified as a Class GAA groundwater (URI Environmental Data Center and Rhode Island GIS 2016b, 2016c). Class GAA groundwaters are known or presumed suitable for drinking water use without treatment and fall within a water supply priority for the area (Rhode Island DEM 2009).

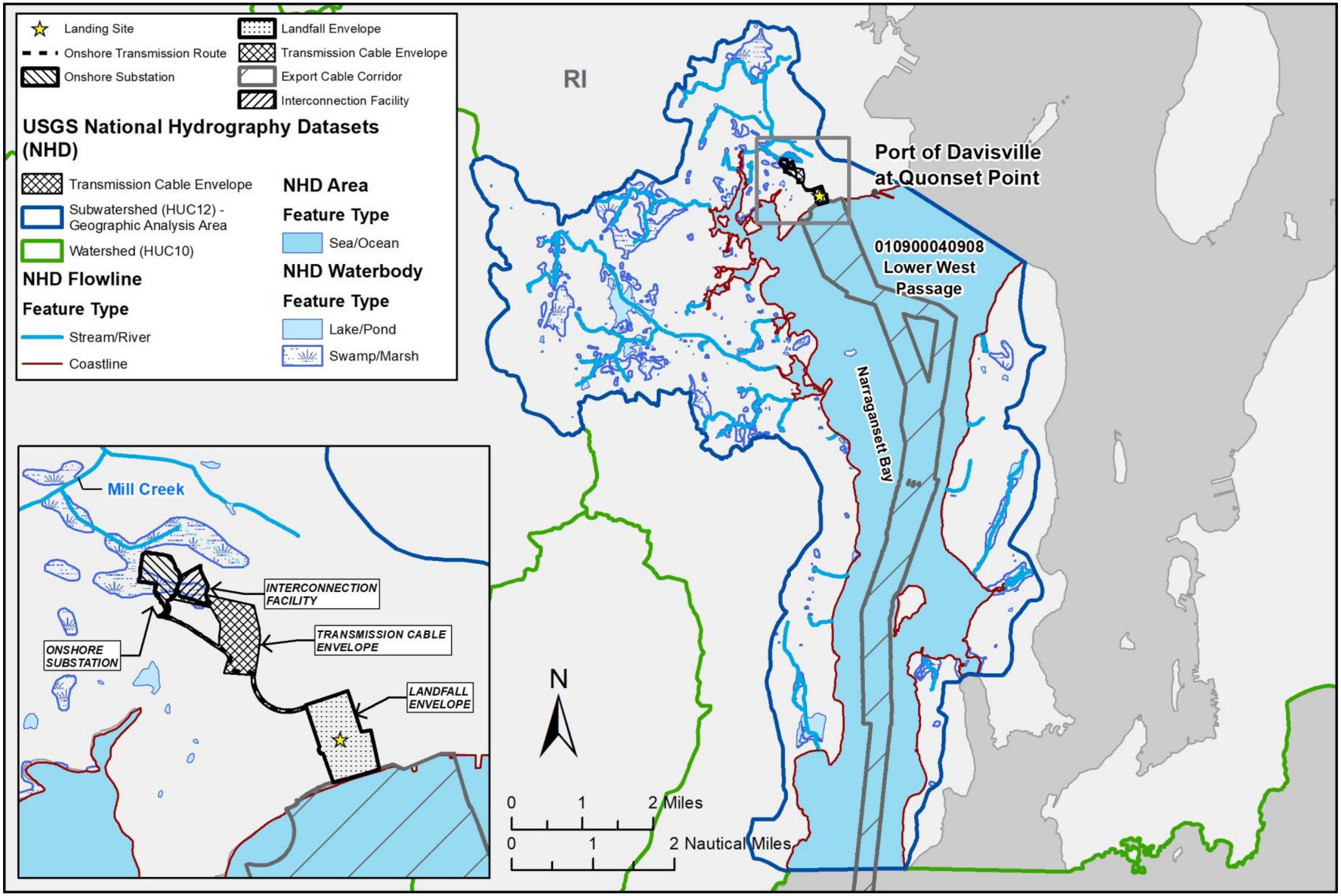

Figure 3.21-2. Geographic analysis area for onshore water quality.

There are 12 hazardous waste generating facilities near the Project (EPA 2021a). One of these facilities, the Senesco Marine Repair Yard, is approximately 0.7 mile from the eastern edge of the Project and 0.5 mile from the northeast corner of the cable corridor. The Senesco Marine Repair Yard has a current CWA violation within the past 12 months due to a violation of their NPDES permit (EPA 2021b). There is one hazardous waste cleanup site (EPA ID#: RID063900690) that includes the landfall work area (EPA 2021c). The waste storage container areas and tanks at this site have been “clean closed” in accordance with Resource Conservation and Recovery Act regulations, and there are no current identified violations at the facility (EPA 2021c, 2021d).

3.21.1.2.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential onshore water quality impacts associated with onshore activities directly connected to or supporting future cumulative offshore wind development in the GAA. Analysis of impacts associated with ongoing and future non–offshore wind activities is provided in Appendix E1.

<u>Accidental releases and discharges:</u> Reasonably foreseeable onshore activities supporting OSW could contribute to changes in water quality from accidental releases and discharges, dispersal of contaminants during routine spills, or accidental releases of contaminated or hazardous materials or debris if surface water bodies are intersected. Routine spills that reach surface water would be expected to disperse rapidly (BOEM 2015).

Future onshore activities supporting OSW would be expected to comply with any applicable permit requirements, including spill controls, to minimize, reduce, or avoid impacts on surface water and groundwater quality. Degradations to onshore water quality from future onshore activities are expected to be localized and temporary to long term, depending on the nature of the activities, although overall water quality is expected to continue to meet Rhode Island water quality standards (250 RICR 150.05) (Rhode Island Department of State 2018). Surface and groundwater bodies would be monitored and managed to meet water quality standards and drinking water resource protections. As a result, adverse impacts from future onshore activities supporting OSW on onshore water quality under the No Action Alternative would be short term to long term **negligible** to **minor** adverse.

<u>New cable emplacement/maintenance:</u> Future onshore activities supporting OSW could result in changes to water quality from cable-related land disturbance, such as surficial digging, land clearing, trenching, HDD, and use of vehicles, that could contribute to erosion and sedimentation. These activities would be expected to comply with any applicable permit requirements to implement erosion and stormwater controls to minimize, reduce, or avoid impacts on water quality. Degradations to onshore water quality from future onshore activities are expected to be localized and temporary to long term, depending on the nature of the activities, although overall water quality is expected to continue to meet Rhode Island water quality standards (250 RICR 150.05). Waterbodies would be monitored and managed to meet water quality standards and drinking water resource protections. As a result, adverse impacts from future activities on onshore water quality under the No Action Alternative would be temporary to long term **negligible** to **minor** adverse.

<u>Port utilization:</u> Future onshore activities supporting OSW are expected to continue to use ports and would likely require expansion or modification of existing onshore port facilities in the analysis area. These port-related activities would include land disturbance.

Future expansion or modification of existing ports in addition to increased use could also increase the risk of accidental spills or discharges. However, these actions would be localized, and port improvements would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on onshore water quality under the No Action Alternative would be short to long term but **negligible** to **minor** adverse. Port activities would not include surficial digging that could encounter groundwater; as a result, there are no potential impacts on groundwater from port use (Rhode Island Department of State 2018).

Presence of structures: The presences of structures from future onshore activities supporting OSW would result in an increase in impervious surfaces that could contribute to stormwater runoff to nearby waterbodies. These activities would be expected to comply with any applicable permit requirements to implement erosion and stormwater controls to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on onshore water quality under the No Action Alternative would be short term to long term **negligible** to **minor** adverse.

3.21.1.2.2 Conclusions

Under the No Action Alternative, BOEM would not approve the COP; Project construction and installation, O&M, and decommissioning would not occur; and potential impacts on onshore water quality associated with the Project would not occur. However, ongoing and future activities would continue to contribute temporary to long-term impacts on water quality from onshore erosion and sedimentation, or discharges, dispersal of contaminants during routine spills.

BOEM anticipates that the range of impacts for reasonably foreseeable offshore wind activities and connected onshore activities would be **negligible** to **minor** adverse due to short-term erosion and sedimentation, discharges, and dispersal of contaminants during accidental and routine spills. As described in Appendix E1, BOEM anticipates that the range of impacts for ongoing and reasonably foreseeable offshore activities other than offshore wind would be **negligible** to **minor** adverse primarily due to temporary or short-term disturbance to sediments during port expansion and other onshore construction and installation activities (e.g., beach and coastal restoration projects). Other reasonably foreseeable non–offshore wind IPFs with potential for routine and/or accidental releases or sediment disturbance are either 1) not expected to overlap with the GAA spatially and temporally or 2) would not be expected to have measurable impacts on the overall water quality in the GAA as discussed in Appendix E1.

BOEM anticipates that the impacts associated with future offshore wind activities in the GAA for onshore water quality combined with ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable activities other than offshore wind would result in **minor** adverse impacts because the effects would be small and the resource would recover completely without remedial or mitigating action.

3.21.2 Environmental Consequences

3.21.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

This assessment analyzes the maximum-case scenario; however, there is the potential for variances in the proposed Project build-out, as defined in the PDE (see Appendix D). The Project design parameters that would influence the magnitude of the impacts on offshore waters include the number of WTGs and distance of installed IAC. Construction and operations activities for fewer WTGs and a shorter IAC distance could result in similar or lower impacts than described in Section 3.21.2.2. For onshore waters, the Project design parameters that would influence the magnitude of the impacts include the location of and construction of or within the OnSS, ICF, and landfall work area. However, EPMs implemented during both construction and decommissioning, as well as a facility-specific spill plan implemented during O&M, would decrease the potential for impacts to onshore waters. Likewise, the implementation of the Project OSRP would help minimize impacts on offshore water quality from spills. These EPMs would be implemented across all alternatives; therefore, BOEM would not expect measurable potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for water quality across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Table E1-4 in Appendix E1.

Table 3.21.1 discloses IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action follows the table. Detailed analysis of other considered action alternatives is also provided below the table if the analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4 to facilitate reader comparison across alternatives.

The conclusion section within each alternative analysis discussion includes a rationale for the overall impact determination. The overall impact of any alternative would be **minor** adverse because the effects would be small, and the resource would be expected to recover completely without remedial or mitigating action.

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Table 3.21-1. Alternative Comparison Summary for Water Quality

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Accidental releases and discharges	**Offshore:** Routine spills would result in little change to water quality and would therefore be localized, short term, and **minor** adverse. In the unlikely event an allision or collision involving Project vessels or components resulted in a large spill, impacts on water quality would be **minor** to **moderate** adverse, and would range from short term to long term, depending on the type and volume of material released, the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill, and effectiveness of the cleanup techniques deployed. Vessel operators would be required to comply with federal and international requirements for the management of shipboard trash and the USCG ballast water management requirements outlined in 33 CFR 151 and 46 CFR 162. Accidental releases of trash and debris would be infrequent and **negligible** adverse, and any allowed vessel discharges, such as bilge and ballast water, would be restricted to uncontaminated or appropriately treated liquids.	**Offshore**: Fuels and oils would be required for Proposed Action offshore equipment, vessels, and infrastructure. The volumes of fuels and oils and number of vessels required during O&M and decommissioning would be less than that required during construction and installation. Should a spill occur, response and containment procedures would limit the reach of the spill to a localized area, where changes to water quality would be detectable and would exceed water quality standards. As a result, adverse impacts on water quality would be short term, with spills generally dispersing within days (BOEM 2015), and **minor** to **moderate** adverse, depending on the severity of the spill. In the unlikely event an allision or collision involving Project vessels or components results in a large spill, impacts on water quality would also be **minor** to **moderate** adverse, and short term to long term, depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill. Accidental releases of trash and debris would be infrequent and **negligible** adverse because Project actions would comply with federal and international requirements for management of shipboard trash and USCG regulations regarding waste and discharge. The Proposed Action could add accidental releases of fuels, oils, or hazardous material; sediment; and/or trash and debris to conditions under the No Action Alternative. BOEM estimates that the Project would result in an up-to-56% increase in total chemical usage over the No Action Alternative within the offshore water quality GAA. All vessels associated with the Proposed Action and other offshore wind projects would comply with the USCG requirements for the prevention and control of oil and fuel spills. Additionally, training and awareness of EPMs (see Table F-1 in Appendix F) proposed for waste management and mitigation of marine debris would be required of Revolution Wind Project personnel. For this reason, the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term to long-term **minor** to **moderate** adverse impacts.	**Offshore:** Alternatives C through F would reduce the number of WTG foundations. This would require less fuels and oils associated with equipment, vessels, and infrastructure; less fuels and oils stored at WTGs; and less volumes of associated trash and debris. These alternatives would also likely reduce the number and duration of vessels required during construction and installation, O&M, and decommissioning activities. Under all action alternatives, Project EPMs (see Table F-1 in Appendix F), permit requirements, controls, and procedures would be implemented as part of the Project to reduce the potential or extent of offshore spills, thereby avoiding or minimizing impacts on water quality. Therefore, impacts under these alternatives would be similar to the Proposed Action: short term to long term **negligible** to **moderate** adverse. Ongoing and planned actions, including those under Alternatives C through F, would require fuels and oils. Any Project-related accidental spills or discharges, including those associated with vessel allisions or collisions, would add to water quality impacts from other planned actions, albeit at potentially slightly lower volumes than the Proposed Action under these alternatives. Therefore, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in short-term to long-term and **minor** to **moderate** adverse cumulative impacts on water quality.			
	Onshore: Surface and groundwater bodies would be monitored and managed to meet water quality standards and drinking water resource protections. As a result, adverse impacts from future onshore wind activities supporting OSW on onshore water quality under the No Action Alternative would be short term to long term **negligible** to **minor** adverse**.**	**Onshore:** Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, the adverse impact on water quality would be short term **negligible** to **minor** adverse**.**	**Onshore:** Alternatives C through F would not change Project onshore activities; therefore, impacts would remain the same as the Proposed Action: short term **negligible** to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Anchoring and new cable emplacement/ maintenance	**Offshore:** Disturbances to the seafloor during anchoring would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to the anchorage area. BOEM anticipates that future offshore wind projects would use dredging only when necessary and would rely on other cable-laying methods for reduced impacts (such as jet plow or mechanical plow) where feasible. Furthermore, these impacts from individual projects would not overlap with one another spatially or temporally. As a result, adverse impacts on offshore water quality under the No Action Alternative would be **minor** adverse and temporary.	**Offshore**: Changes to water quality would be detectable but would not result in degradation of water quality that would exceed water quality standards. As a result, adverse impacts on offshore water quality from anchoring, potential in situ munitions and explosives of concern (MEC)/UXO disposal, and cable placement activities under the Proposed Action would be **minor** adverse and temporary. BOEM estimates a cumulative total of 7,143 acres of cabling-related disturbance for the Proposed Action plus all other future offshore wind projects and 3,876 acres of anchoring-related disturbance for the Proposed Action plus all other future offshore wind projects. Suspended sediment concentrations during activities other than dredging would be within the range of natural variability typical for the affected area. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in short-term **mino**r adverse cumulative impacts to water quality.	**Offshore:** Alternatives C through F would reduce the number of WTGs and scour protections associated with IACs. This would require fewer seafloor disturbances during construction and installation, O&M and decommissioning; however, the types and extent of seafloor disturbances would be similar, and the impacts on water quality would be comparable. As a result, impacts to water quality under the Habitat Alternative would be similar to the Proposed Action: **minor** adverse and temporary. Total anchoring and cabling seafloor disturbance that could occur from ongoing and planned actions, including those actions under Alternatives C through F, would be similar but slightly reduced from the Proposed Action. Project-related seafloor disturbances would add to water quality impacts. Therefore, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in short-term and **minor** adverse cumulative impacts on water quality.			
	Onshore: Degradations to onshore water quality from future onshore activities would be localized and temporary to long term, depending on the nature of the activities, although overall water quality is expected to continue to meet Rhode Island water quality standards (250 RICR 150.05). As a result, adverse impacts from future activities on onshore water quality under the No Action Alternative would be temporary to long term **negligible** to **minor** adverse**.**	**Onshore:** The implementation of EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, adverse impacts on onshore water quality under the Proposed Action would be short term **negligible** to **minor** adverse.	**Onshore:** Alternatives C through F would not change Project onshore activities; therefore, impacts would remain the same as the Proposed Action: short term **negligible** to **minor** adverse.			
Port utilization	**Offshore:** Port activities could increase vessel traffic, suspension and turbidity from in-water work, and the risk of accidental spills or discharges. However, these actions would be localized, and port improvements would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on offshore water quality under the No Action Alternative would be short term to long term **minor** adverse.	**Offshore:** Port-related actions would be localized, and port activities would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on offshore water quality under the Proposed Action would be short to long term but **minor** adverse. Cumulative impacts associated with the Proposed Action and past, present, and reasonably foreseeable future activities would be **negligible** to **minor** adverse.	**Offshore:** The types and extent of port activities under Alternatives C through F would be the same as described for the Proposed Action. Therefore, impacts would be short to long term but **minor** adverse. Cumulative impacts associated with Alternatives C through F and past, present, and reasonably foreseeable future activities would be the same as described for the Proposed Action: **negligible** to **minor** adverse.			
	Onshore: Future expansion or modification of existing ports in addition to increased use could increase land disturbance and the risk of accidental spills or discharges. However, these actions would be localized, and port improvements would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on onshore water quality under the No Action Alternative would be short to long term but **negligible** to **minor** adverse.	**Onshore:** The implementation of EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, adverse impacts on onshore surface water quality under the Proposed Action would be temporary to short term **negligible** to **minor** adverse.	**Onshore:** Alternatives C through F would not change Project onshore activities; therefore, impacts would remain the same as the Proposed Action: temporary to short term **negligible** to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) Up to 100 WTGs	Alternative C (Habitat Alternative) 64 or 65 WTGs	Alternative D (Transit Alternative) 78 to 93 WTGs	Alternative E (Viewshed Alternative) 64 or 81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Presence of structures	**Offshore:** Structures could disturb seafloor within the water quality GAA from foundation and scour protection installation and disrupt bottom current patterns, leading to increased movement, suspension, and deposition of sediments. BOEM anticipates that developers would implement best management practices to minimize seafloor disturbance from foundations, scour, and cable installation. As a result, impacts on offshore water quality under the No Action Alternative would be localized, short term, and **minor** adverse.	**Offshore:** BOEM estimates that the Project would result in an up-to-50% increase in total structures over the No Action Alternative within the offshore water quality GAA. EPMs in Table F-1 in Appendix F would be implemented to minimize seafloor disturbance from foundations and scour. As a result, adverse impacts on offshore water quality under the Proposed Action would be short term **minor** adverse. Because of the limited extent of impacts and BOEM's expectation that Revolution Wind and other developers would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality, the Proposed Action when combined with past, present, and reasonably foreseeable projects would also result in **minor** adverse and long-term impacts to water quality.	**Offshore:** Alternatives C through F would reduce the number of WTGs and scour protection associated with foundations. This would require fewer acres of seafloor disturbance during construction and installation, O&M, and decommissioning that could disrupt bottom current patterns and lead to scouring; however, the types of seafloor disturbance and changes to patterns and flows would be similar. For comparison, Alternatives C and E would reduce seafloor disturbance by up to 35%, Alternative D would reduce seafloor disturbance by up to 21.5%, and Alternative F would reduce seafloor disturbance by up to 43%, as compared to the maximum-case scenario for the Proposed Action. Implementation of Alternative F in conjunction with Alternatives C, D, and E would further reduce seafloor disturbance for these alternatives by up to 8%, 21.5%, and 8%, respectively. As a result, impacts to offshore water quality under Alternatives C through F would be similar to the Proposed Action: short term **minor** adverse. See Table E-4 in Appendix E for foundation construction footprint calculations per alternative. Alternatives C through F would result in an up-to-27 to 45% increase in structures from the No Action Alternative. New structures related to Alternatives C through F would add to seafloor disturbances and disruptions to bottom current patterns that would lead to scouring and associated water quality impacts. However, for similar reasons as the Proposed Action, Alternatives C through F when combined with past, present, and reasonably foreseeable activities would result in long-term and **minor** adverse cumulative impacts on water quality.			
	Onshore: The presences of structures from future onshore activities supporting OSW would result in an increase in impervious surfaces that could contribute to stormwater runoff to nearby waterbodies. These activities would be expected to comply with any applicable permit requirements to implement erosion and stormwater controls to minimize, reduce, or avoid impacts on water quality. As a result, adverse impacts on onshore water quality under the No Action Alternative would be short to long term **negligible** to **minor** adverse**.**	**Onshore:** The implementation of EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, impacts on onshore water quality under the Proposed Action would be localized, short term, and **negligible** to **minor** adverse.	**Onshore:** Alternatives C through F would not change Project onshore activities; therefore, impacts would remain the same as the Proposed Action: short term **negligible** to **minor** adverse.			

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3.21.2.2 Alternative B: Impacts of the Proposed Action on Water Quality

3.21.2.2.1 Construction and Installation

Offshore Activities and Facilities

Accidental releases and discharges: Fuels and oils would be required for Proposed Action offshore construction and installation equipment, vessels, and infrastructure over the 18-month construction and installation period. In the event of a spill or release during construction and installation activities, offshore water quality would be degraded. Most inadvertent spills of fuels and oils used during construction and installation would be classified as routine and minor adverse because of their size (i.e., spills less than 10 barrels, or 420 gallons) and rapid dispersion (BOEM 2015). As described in Section 3.21.1.2, the likelihood of a spill due to construction and installation activities and weather events is low (once per 1,000 years). A draft OSRP has been prepared for the Project and includes processes for rapid spill response, containment, cleanup, and other measures that would help minimize impacts on water quality from spills (see COP Appendix D).

Fuels and oils would be used and stored at WTGs and OSSs. A maximum of approximately 7,530 gallons of coolants, fuels, oils and lubricants would be stored at each WTG (or a total of approximately 753,000 gallons for the maximum 100 proposed WTGs), and a maximum of 132,400 gallons of fuels, oils, and lubricants would be stored at each OSS (or a total of approximately 264,800 gallons for the two proposed OSSs). Secondary containment measures would be implemented for all diesel tanks at WTGs (vhb 2022). Under the Proposed Action, the highest possible spill would be the inadvertent release of fuels and oils stored at WTGs and OSSs, which would contain up to 1,018,000 gallons of fuels and oils. Project EPMs (see Table F-1 in Appendix F), permit requirements, controls, and procedures would be implemented as part of the Project to reduce the potential or extent of offshore spills, thereby avoiding or minimizing impacts on water quality. Should a spill occur, response and containment procedures would limit the reach of the spill to a localized area, where changes to water quality would be detectable and would exceed water quality standards. As a result, adverse impacts on water quality would be short term, with spills generally dispersing within days (BOEM 2015), and **minor** to **moderate** adverse, depending on the severity of the spill.

Construction of the Proposed Action would require as many as 61 vessels. Vessels would be equipped with spill containment and cleanup materials, and any accidental spill or release of fuels, oils, or other hazardous materials would be managed through the Project’s OSRP (vhb 2022). All construction-related vessels would be required to comply with regulatory requirements related to the prevention and control of spills and discharges (vhb 2022). The chance of a spill occurring due to vessel allisions or collisions would be low (once per 1,000 years). In the unlikely event an allision or collision involving Project vessels or components results in a large spill, impacts on water quality would be **minor** to **moderate** adverse, and short term to long term, depending on the type and volume of material released and the specific conditions (e.g., depth, currents, weather conditions) at the location of the spill.

The Proposed Action could also result in accidental releases of trash and debris from vessels or in situ MEC/UXO disposal into offshore waters. EPMs in Table F-1 in Appendix F would be implemented to avoid or minimize impacts on water quality from releases of trash or debris. Accidental releases of trash and debris would be infrequent and **negligible** adverse because vessels would comply with federal and international requirements for management of shipboard trash and USCG regulations regarding waste and discharge. Foreign-flagged vessels would also have a USCG-compliant and certified ballast water management system. Any allowed vessel discharges, such as bilge and ballast water, would be restricted to uncontaminated or appropriately treated liquids. Should an accidental release occur, it would be limited to the localized area; adverse impacts on water quality would be short term **minor** to **moderate** adverse.

Existing restoration and protection initiatives established for offshore areas, including those developed as part of the Long Island Sound Study initiative (Long Island Sound Study 2021), Bay Assessment & Response Team (Rhode Island DEM 2021c), Rhode Island Beach Monitoring Program (Rhode Island Department of Health 2021), and Rhode Island Environmental Monitoring Collaborative (RIEMC 2021), would help identify and manage water quality degradations, should they occur.

<u>Anchoring and new cable emplacement/maintenance:</u> Approximately 3,178 acres and 4,009 acres of seafloor could be impacted by anchoring and cable placement, respectively, under the Proposed Action within the offshore water quality GAA. Potential in situ MEC/UXO disposal could also result in sediment suspension and disturbance. Disturbances to the seafloor would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to the anchorage, disposal, or cable placement area. Sediment modeling completed for the Proposed Action indicates that sediment suspension and deposition would occur during in-water offshore activities (RPS 2022). The modeling showed that in most locations the total suspended solids plumes are limited to the bottom 10 feet of the water column and are temporary at any given location. Suspended sediments would settle within hours or days, including up to 6.7 hours in the RWF IAC, 61 hours in the RWEC-OCS, approximately 70 hours along the RWEC-RI, and 70 hours at the landing site where HDD would occur.

EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. Changes to water quality would be detectable but would not result in degradation of water quality that would exceed water quality standards. As a result, adverse impacts on offshore water quality from anchoring and cable placement activities under the Proposed Action would be **minor** adverse and temporary.

<u>Port utilization:</u> The Project would use nearby ports for a construction hub, for WTG storage and pre-commissioning, and for foundation marshalling and fabrication. These activities would result in increased vessel traffic and increased in-water activities, which would contribute to increased suspension and turbidity. As many as 61 vessels would be required during construction and installation. These activities could also increase the risk of accidental spills or discharges. Port-related actions would be localized, and port activities would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality. In addition, EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality. As a result, adverse impacts on offshore water quality under the Proposed Action would be short to long term but **minor** adverse.

It is not known at this time if port expansions or modifications would be required for the Proposed Action (vhb 2022). If so, these activities would require in-water work, including vessel use, that would increase sediment suspension and turbidity. Impacts from these activities would be similar to those described above for port uses.

<u>Presence of structures:</u> The Proposed Action would result in up to 100 monopile foundations for WTGs and two monopile foundations for OSSs within the GAA for offshore water quality. These structures could temporarily disturb up to approximately 720 acres (7.2 acre per foundation) during seafloor

preparation. Foundations would encompass a total footprint of approximately 71 acres (0.7 acre per foundation) of seafloor disturbance and scour protection. Seafloor disturbance would occur from foundation and scour protection installation, and the presence of structures would disrupt bottom current patterns and lead to increased movement, suspension, and deposition of sediments. Project-related scouring could impact water quality through the formation of sediment plumes, and structures could reduce wind-forced mixing of surface waters. Flows around foundations could increase vertical mixing of the water column. These changes in currents and mixing would affect water quality but would vary seasonally and regionally. EPMs in Table F-1 in Appendix F would be implemented to minimize seafloor disturbance from foundations and scour, including the installation of scour protection and cable armoring where burial is not possible, that would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, adverse impacts on offshore water quality under the Proposed Action would be localized, short term, and **minor** adverse.

Onshore Activities and Facilities

<u>Accidental releases and discharges:</u> Onshore facilities would not cross surface waterbodies. Onshore construction equipment, vehicles, and infrastructure under the Proposed Action would require fuels and oils during the construction and installation period. Although unlikely due to distance to closest stream of 200 feet, any inadvertent spills occurring during construction and installation, such as the release of fuels and oils from vehicles or infrastructure, would be classified as routine and minor adverse (BOEM 2015).

Table F-1 in Appendix F includes EPMs to avoid or minimize potential spill impacts on water quality, to comply with all general construction permit requirements, and to implement runoff controls and buffers. In addition, Revolution Wind would develop and implement a stormwater pollution prevention plan and HDD inadvertent release plan to protect nearby surface waters. Although these procedures would reduce the likelihood and extent of routine spills, spills in or near surface waterbodies would contribute to detectable changes that could result in an exceedance of water quality standards. Therefore, the adverse impact on water quality would be short term **minor** adverse.

There are no groundwater resources crossed by the Project. As described in Section 3.21.1.3, the nearest groundwater recharge area would be approximately 1.2 miles from the Project. At this distance, the risk of any inadvertent spill or release to groundwater during construction and installation of the Project would be **negligible** adverse.

<u>New cable emplacement/maintenance</u>: The Project would require the installation of permanent (over the life of the Project) onshore export cable (i.e., the RWEC). This activity would require temporary (up to 18 months) ground-disturbing activities including surficial digging, land clearing, trenching, HDD, and use of equipment and vehicles. The RWEC route does not directly intersect any surface waterbody; however, surface disturbance associated with installation could contribute to erosion and sedimentation in nearby surface waterbodies, thereby leading to changes in water quality. Overall construction activities and Project infrastructure would disturb more than 1 acre, and discharges would therefore need to be permitted through a general construction permit under the NPDES program. Revolution Wind would also develop a stormwater pollution prevention plan as part of the permitting process that would result in implementation of erosion and sediment controls prior to and during construction and installation. EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind

would comply with all permit and regulatory requirements related to water quality. As a result, adverse impacts on onshore water quality under the Proposed Action would be localized, short term, and **negligible** to **minor** adverse.

The distance between Project-related land-disturbing activities and the nearest groundwater recharge area (1.2 miles) would result in **negligible** adverse risks of a spill or release reaching groundwater resources.

<u>Port utilization:</u> The Project would use nearby ports to support construction and installation of the Proposed Action. Increased use and related activities at ports could increase the risk of accidental spills or discharge to nearby surface waterbodies. Inadvertent spills or releases during construction and installation would be classified as routine and would be localized, short term, and minor adverse. It is not known at this time if port expansions or modifications would be required. If so, these activities would require surface disturbances that would contribute to erosion and sedimentation in nearby surface waterbodies, thereby leading to changes to water quality.

EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As a result, adverse impacts on onshore surface water quality under the Proposed Action would be temporary and **negligible** to **minor** adverse. No impacts on groundwater are anticipated from port use during onshore construction and installation because there would be no required surface disturbance that could encounter groundwater or result in water quality degradations through runoff into groundwater recharge areas.

<u>Presence of structures:</u> The presence of structures from the Proposed Action would result in an increase in impervious surfaces (20 acres) that could contribute to stormwater runoff to nearby surface waterbodies. The OSS would encompass approximately 16 acres, and the onshore ICF would temporarily encompass approximately 4 acres. Fill materials would be used for installation of structures. None of the onshore facilities of the RWEC route directly intersect any surface waterbody; however, surface disturbance associated with installation of onshore facilities could contribute to erosion and sedimentation in nearby surface waterbodies, thereby leading to changes in water quality. EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As described under the new cable emplacement/maintenance IPF, discharges would be permitted through a general construction permit under the NPDES program. Revolution Wind would also develop a stormwater pollution prevention plan as part of the permitting process that would result in implementation of erosion and sediment controls prior to and during construction and installation. As a result, impacts on onshore water quality under the Proposed Action would be localized, short term, and **negligible** to **minor** adverse. The distance between Project-related land-disturbing activities and the nearest groundwater recharge area (1.2 miles) would result in minimal risk of runoff reaching groundwater resources; **negligible** adverse impacts on groundwater are anticipated from the presence of structures during onshore construction and installation.

3.21.2.2.2 Operations and Maintenance and Decommissioning

Offshore Activities and Facilities

<u>Accidental releases and discharges:</u> O&M and decommissioning of the offshore portion of the Project would lead to similar adverse impacts on water quality from inadvertent spills or releases that could occur during construction and installation. The volumes of fuels and oils and number of vessels required during

O&M and decommissioning would be less than that required during construction and installation (vhb 2022). The same Project features and EPMs described for offshore construction and installation (see Section 3.21.2.2.1) would be implemented during O&M and decommissioning to avoid or minimize potential spill impacts on water quality. Most inadvertent spills of fuels and oils used during O&M and decommissioning would be classified as routine and minor adverse. Should a routine spill occur, it would be temporarily detectable and would disperse rapidly, thereby limiting the magnitude and extent of changes to water quality. Therefore, changes to water quality would be localized, short term, and **minor to moderate** adverse, depending on the severity of potential spills or releases.

<u>Anchoring and new cable emplacement/maintenance:</u> Anchoring and cable-related activities during O&M and decommissioning would contribute to changes in offshore water quality from the resuspension and deposition of sediment. O&M and decommissioning of the offshore portion of the Project would lead to similar minor adverse and temporary adverse impacts on water quality from anchoring and new cable emplacement and maintenance that would occur during construction and installation. Fewer anchoring activities would occur during O&M and decommissioning activities compared to construction and installation. Cable activities would also be less frequent during O&M and decommissioning and would typically include maintenance activities that would result in less seafloor disturbance than installation activities during construction and installation. EPMs in Table F-1 in Appendix F would avoid or minimize impacts on water quality, and Revolution Wind would comply with all permit and regulatory requirements related to water quality. As described for construction and installation (see Section 3.21.2.2.1), suspended sediments would typically settle within hours or days, and the extent of deposition would be limited. Changes to water quality from anchoring and cable activities would be detectable but would not result in degradation of water quality that would exceed water quality standards. As a result, adverse impacts on offshore water quality under the Proposed Action would be **minor** adverse and temporary.

<u>Port utilization:</u> The Project would use nearby ports to support O&M and decommissioning of the Project. As described under offshore construction and installation, these activities would result in increased vessel traffic and increased in-water activities, which would contribute to increased suspension and turbidity. Up to 16 vessels would be required during O&M and decommissioning. These activities could also increase the risk of accidental spills or discharges. See offshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on offshore water quality under the Proposed Action would be short to long term but **minor** adverse.

<u>Presence of structures:</u> O&M would not result in additional structures that would lead to impacts on water quality. During decommissioning, structures would be removed to a depth of 15 feet below the seafloor (vhb 2022), which would reduce in-water structures that have disrupted bottom current patterns and led to scouring (as described for construction and installation). Water quality during O&M would remain the same, whereas water quality during decommissioning could result in short-term changes to water quality; however, these changes would be limited in terms of duration and extent (similar to those described for construction and installation of structures). See offshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on offshore water quality under the Proposed Action would be short term **minor** adverse.

Onshore Activities and Facilities

Accidental releases and discharges: O&M activities would require vehicles and equipment that require the use of fuels, oils, and lubricants. The volumes of fuels and oils and number of vehicles required during O&M and decommissioning would be less than that required during construction and operations (vhb 2022). Although unlikely due to distance to closest surface waterbody of 200 feet, any inadvertent spills in onshore waters during O&M or decommissioning would be classified as routine and **minor** adverse (BOEM 2015). See onshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on onshore surface water quality under the Proposed Action would be short term **minor** adverse. Similar to onshore construction and installation, O&M and decommissioning activities would be distanced far enough from groundwater recharge areas (at least 1.2 miles) that the risk of a spill or release reaching groundwater resources would be **negligible** adverse.

New cable emplacement/maintenance: O&M would require limited land disturbance should maintenance be required for underground infrastructure (i.e., transmission cable). Decommissioning of the onshore portion of the Project would lead to the same types of impacts on surface water quality from erosion, sedimentation as described under construction and installation. See onshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on offshore water quality under the Proposed Action would be temporary and **negligible** to **minor** adverse.

The distance between Project-related land-disturbing activities and the nearest groundwater recharge area (1.2 miles) would result in limited risks of a spill or release reaching groundwater resources; **negligible** adverse impacts on groundwater are anticipated from land disturbance during onshore O&M and decommissioning.

Port utilization: The Project would use nearby ports to support O&M and decommissioning of the Project. As described for onshore construction and installation, increased use and related activities at ports could increase the risk of accidental spills or discharge to nearby surface waterbodies. See onshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on onshore surface water quality under the Proposed Action would be temporary and **minor** adverse. **Negligible** adverse impacts on groundwater are anticipated from port use during onshore construction and installation because there would be no required surface disturbance that could encounter groundwater or result in water quality degradations through runoff into groundwater recharge areas.

Presence of structures: O&M would not result in additional structures that would lead to impacts on water quality. During decommissioning, structures would be removed in compliance with applicable laws and regulations at that time (vhb 2022). Water quality during O&M and decommissioning would remain the same, whereas water quality during decommissioning could result in short-term changes to water quality; however, these changes would be limited in terms of duration and extent (similar to those described for construction and installation of structures). See onshore activities and facilities analysis in Section 3.21.2.2.1 for details. As a result, adverse impacts on offshore water quality under the Proposed Action would be short term **negligible** to **minor** adverse.

3.21.2.2.3 Cumulative Impacts

Offshore Activities and Facilities

Accidental releases and discharges: The Proposed Action could noticeably add accidental releases of fuels, oils, or hazardous material; sediment; and/or trash and debris to conditions under the No Action Alternative. BOEM estimates that the Project would result in an up-to-56% increase in total chemical usage over the No Action Alternative within the offshore water quality GAA. This risk would be increased primarily during construction and installation, O&M, and decommissioning. When the Project is combined with other offshore wind projects, up to approximately 2.8 million gallons of coolants, fuels, oils, and lubricants could cumulatively be stored within WTG foundations and the OSS within the offshore water quality GAA. All vessels associated with the Proposed Action and other offshore wind projects would comply with the USCG requirements for the prevention and control of oil and fuel spills. Additionally, training and awareness of EPMs (see Table F-1 in Appendix F) proposed for waste management and mitigation of marine debris would be required of Revolution Wind Project personnel. These releases, if any, would occur infrequently at discrete locations and vary widely in space and time. For this reason, the Proposed Action when combined with other past, present, and reasonably foreseeable projects would result in short-term to long-term **minor** to **moderate** adverse impacts.

Anchoring and new cable emplacement/maintenance: The Proposed Action would result in localized, temporary, and minor incremental impacts to water quality through an estimated 3,178 acres of anchoring and mooring-related disturbance. The Proposed Action would add to the estimated 698 acres of seafloor that could be impacted by anchoring from other reasonably foreseeable offshore wind activities. This would result in a cumulative total of 3,876 acres of anchoring-related disturbance for the Proposed Action, plus all other future offshore wind projects. Therefore, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **minor** adverse cumulative impacts to water quality.

The Proposed Action would result in localized, short-term, and minor adverse impacts to water quality through an estimated 4,009 acres of seafloor disturbance from cable installation, which would temporarily increase suspended sediment and turbidity levels in and immediately adjacent to anchorage areas. This would result in additional turbidity effects, increasing seafloor disturbance due to cable installation, when compared to the No Action Alternative. BOEM estimates a cumulative total of 7,143 acres of cabling-related disturbance for the Proposed Action plus all other future offshore wind projects. Sediment modeling for the Proposed Action indicates that sediment suspension and deposition would occur within an area of up to 328 feet and would settle shortly (hours to days) after the release of sediment (Vinhateiro et al. 2018). Suspended sediment concentrations during activities other than dredging would be within the range of natural variability typical for the affected area. As a result, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **minor** adverse cumulative impacts to water quality.

Port utilization: BOEM expects impacts to water quality due to the increase in port use resulting from the Proposed Action to be negligible to minor adverse. Other offshore wind development would use nearby ports and could also require port expansion or modification. However, Revolution Wind and all other developers would comply with all permit requirements to avoid or minimize water quality impacts. Therefore, cumulative impacts associated with the Proposed Action and past, present, and reasonably foreseeable future activities would be **negligible** to **minor** adverse.

Presence of structures: The Proposed Action would result in long-term and minor adverse impacts to water quality through the installation of 102 structures (100 WTGs and two OSSs). This represents a 50% increase over total estimated WTG and OSS foundations under the No Action Alternative within the offshore water quality GAA. BOEM estimates a cumulative total of 307 structures for the Proposed Action plus all other future offshore wind projects within the offshore water quality GAA. These additional structures could cumulatively add to other offshore impacts to water quality from turbidity due to scour and water current alteration. However, because of the limited extent of impacts and BOEM's expectation that Revolution Wind and other developers would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **minor** adverse and long-term impacts to water quality.

Onshore Activities and Facilities

Accidental releases and discharges: The Proposed Action would result in negligible to minor adverse onshore water quality impacts on surface water due to discharges and due to dispersal of contaminants during routine spills or inadvertent releases. State and local agencies would be responsible for minimizing and avoiding water quality and other impacts during construction and installation. The Project and other reasonably foreseeable projects would be expected to comply with any applicable permit requirements to implement erosion, stormwater, and spill controls to minimize, reduce, or avoid impacts on water quality. As a result, the Proposed Action when combined with past, present, and other reasonably foreseeable projects would result in short-term impacts and **negligible** to **minor** adverse cumulative impacts on onshore water quality.

New cable emplacement/maintenance: The Proposed Action would result in negligible to minor adverse impacts to onshore water quality impacts on surface water and groundwater due to erosion and sedimentation. State and local agencies would be responsible for minimizing and avoiding water quality and other impacts during construction and installation. The Project and other reasonably foreseeable projects would be expected to comply with any applicable permit requirements to implement erosion, stormwater, and spill controls to minimize, reduce, or avoid impacts on water quality. As a result, the Proposed Action when combined with past, present, and other reasonably foreseeable projects would result in short-term impacts and **negligible** to **minor** adverse cumulative impacts on onshore water quality.

Port utilization: The Proposed Action would result in minor adverse impacts to onshore water quality due to changes in surface water quality from increased port-related traffic. The Proposed Action would also add to the increased the risk of accidental spills or discharges. Other offshore wind development would also use nearby ports. Revolution Wind and all other developers would comply with all permit requirements to avoid or minimize water quality impacts. As a result, the Proposed Action when combined with past, present, and other reasonably foreseeable projects would result in short-term impacts and **negligible** to **minor** adverse cumulative impacts on onshore surface water quality. The Proposed Action would not contribute to impacts on groundwater quality.

Presence of structures: The Proposed Action would result in temporary and minor adverse impacts to water quality related to the presence of structures, which would also result in an increase in impervious surfaces (19 acres) through the development of 20 acres for the OnSS and ICF. Other offshore wind development would also include the construction and installation of structures and associated impacts to onshore water quality. These additional structures could cumulatively add to other onshore impacts to water quality from turbidity due to scour and water current alteration. However, because of the limited extent of impacts and BOEM's expectation that Revolution Wind and other developers would comply with all applicable permit requirements to minimize, reduce, or avoid impacts on water quality, the Proposed Action when combined with past, present, and reasonably foreseeable projects would result in **negligible** to **minor** adverse short-term impacts to water quality.

3.21.2.2.4 Conclusions

Although Project construction and installation, O&M, and decommissioning would expose and disturb soils and sediments, onshore facilities would not cross surface waterbodies. Therefore, impacts to water quality from potential erosion, sedimentation, or inadvertent release of contamination or hazardous materials or debris into onshore surface waters are not anticipated and would be short term **negligible** to **minor** adverse. Offshore, Project construction and installation and decommissioning would contribute to increased movement, suspension, and deposition of sediments; changes to water column stratification; and mixing patterns that would affect water quality parameters. Impacts from Project O&M would be much lower than those produced during construction and installation and decommissioning but could also result in erosion, sediment resuspension, deposition, and inadvertent spills. BOEM anticipates that the impacts resulting from the Proposed Action alone would range from **negligible** to **moderate** adverse. Therefore, BOEM expects the overall impact on water quality from the Proposed Action alone to be **minor** adverse because the effect would be small and the resource would be expected to recover completely without remedial or mitigating action. The Proposed Action would not result in any net beneficial change to water quality.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from **negligible** to **moderate** adverse. 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 impacts to water quality because the effect would be small and the resource would be expected to recover completely. The Proposed Action would not result in benefits to water quality.

3.21.2.3 Alternatives C, D, E, and F

Table 3.21.1 discloses IPF findings for each alternative.

3.21.2.3.1 Conclusions

Although Alternatives C through F would reduce the number of WTGs and their associated IACs offshore, which would have an associated reduction in potential changes to movement, suspension, and deposition of sediments; water column stratification; and mixing patterns, BOEM expects that the impacts resulting from each alternative alone would be similar to the Proposed Action and range from **negligible** to **moderate** adverse. Alternatives C through F would not result in any change to onshore water quality as compared to the Proposed Action and would not result in any net beneficial change to water quality.

In the context of other reasonably foreseeable environmental trends and planned actions, BOEM also expects that Alternatives C through F's impacts would be similar to the Proposed Action (with individual IPFs leading to impacts ranging from **negligible** to **moderate** adverse). The overall impacts of each alternative when combined with past, present, and reasonably foreseeable activities would be the same level as under the Proposed Action: **minor** adverse. Alternatives C through F would not result in benefits to water quality.

3.21.2.4 Mitigation

No potential additional mitigation measures for water quality are identified in Table F-2 in Appendix F.

3.22 Wetlands and Other Waters of the United States

3.22.1 Description of the Affected Environment and Environmental Consequences of the No Action Alternative for Wetlands and Other Waters of the United States

Geographic analysis area: The GAA for wetlands and other waters of the United States (WOTUS) is the Lower West Passage subwatershed (Hydrologic Unit Code 010900040908), which overlaps the onshore Project and is the same as the GAA for onshore water quality (see Figure 3.21-2). This area encompasses the drainage basin and network of surface waterbodies that could be affected by Project activities.

Affected environment: Freshwater and tidal wetlands, lakes and ponds, streams, and other WOTUS are found throughout the GAA (see Figure 3.21-2). Wetlands resources and their functions and values are described in Sections 1.3.2 and 3.1.2 of COP Appendix K (vhb 2021). As mapped by the USFWS National Wetlands Inventory, approximately 1,268.1 acres of freshwater forest/shrub wetlands and 99.3 acres of freshwater emergent wetlands are found near streams, lakes, and ponds throughout the GAA. In addition, estuarine and marine wetland habitat is found in tidal areas near the shore of Narragansett Bay.

WOTUS are subject to USACE jurisdiction under Section 404 of the federal Clean Water Act (CWA). However, as described in COP Appendix K, wetland resources also fall under the jurisdiction of the State of Rhode Island following pre-determined physical boundaries mapped on the Rhode Island DEM’s Environmental Resource Map. Based on this map, the onshore Project components are to be located almost entirely within the jurisdiction of the RI CRMC with the exception of a potential segment of an onshore transmission cable route along Roger Williams Way between Mainsail Drive and Circuit Drive, where the jurisdictional WOTUS boundary follows Roger Williams Way (vhb 2021). Under the RI CRMC Coastal Resources Management Program-Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (Freshwater Wetland Rules; 650-RICR-20-00-2), wetlands receive a buffer of 50 feet from the delineated edge of the wetland. The area of land within 50 feet is regulated as a separate wetland resource (RI CRMC 2011).

Freshwater and tidal wetlands (e.g., tidal salt marsh, ruderal forested wetland, ruderal shrub marsh, and vernal pools) were observed in the GAA during the field surveys (vhb 2021). Wetlands and streams delineated within the footprint of onshore Project components and the adjacent areas are shown on Figures 4.3.1-3 and 4.3.1-13 in COP Appendix K. All wetlands, buffers, and ditches within the footprint are regulated by RI CRMC, as summarized in Table 3.22-1. Potentially jurisdictional WOTUS are located outside the footprint of onshore Project components.

Table 3.22-1. Delineated Wetlands by Project Component

Project Component	Freshwater Wetlands (acres)*	Wetland Buffer (acres)†	Regulated Ditch (feet)‡	Waters of the United States
Landfall work area	0	0	0	0
OnSS footprint	< 0.01	0.48	0	0
ICF footprint	0.10	0.24	148.38	0
Onshore cable corridor and envelope	0	0.07	0	0

Source: vhb (2021).

* Freshwater wetlands regulated by RI CRMC based on Environmental Resource Map.

† Area of land within 50 feet of the wetland boundary regulated by RI CRMC.

‡ Human-made ditch that is regulated by RI CRMC as an Area Subject to Stormwater Flowage.

The landfall work area was shifted east to avoid a delineated ruderal forested wetland (Freshwater Wetland 1) that is regulated by the RI CRMC as a freshwater wetland near the coast. Tidal salt marshes west of the landfall work area have also been avoided. There are no wetlands or WOTUS within the onshore transmission cable corridor or easement. However, the cable corridor crosses the 50-foot wetland buffer of Freshwater Wetland 1.

Regulated wetlands within and adjacent to the OnSS and ICF parcels include four freshwater wetlands (Freshwater Wetlands 2–5), tributaries to Mill Creek, and a human-made ditch. Freshwater Wetland 2 (i.e., a small isolated forested wetland) is outside of but adjacent to the OnSS footprint. Freshwater Wetland 3 (i.e., a forested swamp) occurs along the western boundary of the OnSS parcel and continues off-site around Mill Creek. Freshwater Wetland 4 (i.e., a shrub marsh with a forested perimeter) occurs along the northern boundary of the OnSS and ICF parcel. Wetland 5 is a small, isolated scrub-shrub wetland within the ICF footprint that is hydrologically connected to Freshwater Wetland 4 by a human-made ditch that is regulated as an Area Subject to Stormwater Flowage. Tributaries to Mill Creek flow north and west through Freshwater Wetland 3, outside the OnSS footprint (see Figures 4.3.1-3 and 4.3.1-13 in COP Appendix K). Vernal pools were identified within Freshwater Wetlands 4 and 5. The OnSS and ICF footprints are designed to avoid most of the 3.92 acres of wetlands delineated within these parcels.

Warming temperatures, increasing storm severity and frequency, and ongoing rising sea levels impact wetland habitats. Large, severe storms can increase sedimentation and erosion, which can lead to habitat alteration. Offshore wind projects aim to combat climate change and associated effects by reducing GHG emissions.

3.22.1.1 Future Offshore Wind Activities (without Proposed Action)

This section discloses potential impacts to state regulated wetland resources (i.e., freshwater wetlands, buffer, and ditches) and nearby federally regulated WOTUS associated with future offshore wind development. In this and the following sections, the state wetlands and federal WOTUS are collectively referred to as *wetland resources*. Analysis of impacts associated with ongoing activities and future non–offshore wind activities is provided in Appendix E1.

Accidental releases and discharges: However, should offshore wind facilities be located within the GAA, there is a possibility of accidental releases of fuels, oils, and lubricants that could affect wetland resources. Any activity would require a facility-specific spill plan outlining spill prevention training, plans, and steps to contain and clean up spills if they occur. Spills that reach surface water would be expected to disperse rapidly (BOEM 2015). Adverse impacts from accidental releases and discharges would be **negligible** adverse, localized, and temporary to short term due to the likely limited extent and duration of a release.

Permitted routine operational effluent discharges to receiving waters (e.g., such as ballast water) are regulated by the NPDES. Any discharges from future offshore wind projects are not expected to affect wetland resources within the GAA.

New cable emplacement/maintenance: Future offshore wind projects do not include cable emplacement and maintenance within the GAA that would affect wetland resources.

Presence of structures: There are no known future offshore wind activities that have facilities planned within the GAA. Therefore, impacts to wetland resources would be **negligible** adverse.

3.22.1.2 Conclusions

Under the No Action Alternative, there are no known future offshore wind activities that could impact wetland resources in the GAA. Adverse impacts from future activities on onshore wetland resources under the No Action Alternative would be temporary to short term and **negligible** adverse. Impacts associated with future offshore wind activities in the GAA for onshore wetland resources combined with ongoing activities, reasonably foreseeable environmental trends, and reasonably foreseeable activities other than offshore wind would result in **minor** adverse impacts because the effects would be small, and the resource would recover completely.

3.22.2 Environmental Consequences

3.22.2.1 Relevant Design Parameters, Impact-Producing Factors, and Potential Variances in Impacts

The Project design parameters that would influence the magnitude of the impacts on wetland resources include the location of and construction of or within the OnSS, ICF, and landfall work area. The following have occurred or would occur to minimize potential impacts to wetland resources:

- Revolution Wind evaluated siting alternatives for the OnSS using the criteria that included avoidance or minimization of disturbance to wetlands and other ecologically sensitive areas.
- The OnSS and ICF would be located on parcels that are already highly altered and include buried demolition waste.
- Revolution Wind would follow state and federal regulations for alteration of wetland resources.

Erosion control measures implemented during both construction and decommissioning, as well as a facility-specific spill plan implemented during O&M, would decrease the potential for impacts to wetland resources. These Project design parameters would be implemented across all alternatives; therefore, BOEM would not expect potential variances in impacts across the alternatives.

See Appendix E1 for a summary of IPFs analyzed for wetland and WOTUS resources across all action alternatives. IPFs that are either not applicable to the resource or determined by BOEM to have a negligible adverse effect are excluded from Chapter 3 and provided in Table E2-2 in Appendix E1. Offshore and onshore IPFs are addressed separately in the analysis if appropriate for the resource; not all IPFs have both an offshore and onshore component. Where feasible, calculations for specific alternative impacts are provided in Appendix E4, to facilitate reader comparison across alternatives.

Table 3.22-2 provides a summary of IPF findings carried forward for analysis in this section. Each alternative analysis discussion consists of the construction and installation phase, the O&M phase, the decommissioning phase, and the cumulative analysis. If these analyses are not substantially different, then they are presented as one discussion.

A detailed analysis of the Proposed Action is provided following the table. Detailed analysis of other considered action alternatives is also provided below the table if analysis indicates that the alternative(s) would result in substantially different impacts than the Proposed Action.

The Conclusion section within each alternative analysis discussion includes rationale for the overall effect call determination for that alternative. The overall impact of any alternative would be **minor** adverse because the effects on wetland resources would be small and localized, and with implementation of EPMs, wetland resources are expected to recover completely.

Table 3.22-2. Alternative Comparison Summary for Wetlands and Other Waters of the United States Impact-Producing Factor

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Accidental releases and discharges	**Onshore**: Spills that reach surface water would be expected to disperse rapidly (BOEM 2015). Any discharges from future offshore wind projects are not expected to affect wetland resources within the GAA. Adverse impacts from accidental releases and discharges would be **negligible** adverse, localized, and temporary to short term due to the likely limited extent and duration of a release.	**Onshore**: Revolution Wind would prepare a construction-specific plan in accordance with applicable requirements and would outline spill prevention plans and steps to contain and clean up spills that may occur. All onshore activities would be conducted in compliance with the RI Pollutant Discharge Elimination System General Permit for the Discharge of Stormwater Associated with Construction Activities and an approved soil erosion and sedimentation control plan. Therefore, with the implementation of these measures, accidental releases and discharges during onshore construction and installation are expected to result in short-term **minor** adverse impacts within adjacent wetland resources. The potential for accidental releases and discharges during O&M and decommissioning would be less than during construction and installation due to reduced use of drilling fluids, fuels, oils, and lubricants. Stormwater runoff during O&M of onshore facilities could result in turbidity and sediment deposition that could cause short-term **minor** adverse impacts to wetlands or other WOTUS. Therefore, impacts to wetland resources from accidental releases and discharges would be short term **minor** adverse. The contribution from the Proposed Action would be a low percentage of the overall spill risk from ongoing and future activities in the GAA. Any ballast water discharges from the Proposed Action and future offshore wind projects are not expected to affect wetland resources within the GAA. As a result, the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in short-term **negligible** to **minor** adverse impacts to wetland resources.	**Onshore**: Alternatives C through F would have the same onshore activities and facilities as the Proposed Action, therefore, impacts from accidental releases and discharges on wetland resources would be the same as those described for the Proposed Action: **negligible** to **minor** adverse.			
New cable emplacement/ maintenance	**Onshore**: Future offshore wind projects do not include cable emplacement and maintenance within the GAA that would affect wetland resources.	**Onshore**: No direct impacts to wetlands or other WOTUS would occur as a result of onshore cable emplacement or maintenance activities. Temporary soil disturbance during cable installation could disturb and alter nearby wetland habitat, as well as potentially spread invasive species, which could lead to a small, localized reduction in habitat quality. With erosion control and weed management measures in place, any impacts to adjacent wetlands during construction and installation would be short term **negligible** adverse. Land disturbance during O&M would be limited to regular maintenance of underground infrastructure, if needed, and EPMs would limit potential impacts from sedimentation. See Table F-1 in Appendix F for a list of EPMs for wetland resources. Adverse impacts on wetlands and WOTUS under the Proposed Action would be temporary **minor** adverse. The contribution to cumulative impacts to wetland resources from anchoring and cable emplacement is expected to be the same as the Proposed Action because no other past, present, and reasonably foreseeable projects requiring cable placement/maintenance would occur within the GAA. As a result, the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in **minor** adverse short-term impacts to wetlands and WOTUS due to surface disturbance in wetland buffers.	**Onshore**: Alternatives C through F would have the same onshore activities and facilities as the Proposed Action, therefore impacts on wetland resources would be the same as the Proposed Action: **negligible** to **minor** adverse.			

Impact-Producing Factor	No Action Alternative	Alternative B (Proposed Action) up to 100 WTG	Alternative C (Habitat Alternative) 64–65 WTGs	Alternative D (Transit Alternative) 78–93 WTGs	Alternative E (Viewshed Alternative) 64–81 WTGs	Alternative F (Higher Capacity Turbine Alternative) 56 WTGs
Presence of structures	**Onshore**: There are no known future offshore wind activities that have facilities planned within the GAA. Therefore, impacts to wetland resources would be **negligible** adverse.	**Onshore:** Land disturbances from the presence of structures associated with Project construction and installation would include the 19.53-acre landfall work area, 7.04-acre OnSS, 3.76-acre ICF, and 16.58-acre onshore transmission cable envelope. The OnSS and ICF structures would permanently remove and replace 0.11 acre of freshwater forested wetland with impervious surface (less than 0.1% of wetlands within the GAA). Soil disturbance during construction and installation could also alter nearby wetland habitat due to sedimentation and spread invasive species, leading to a small, localized reduction in habitat quality. Revolution Wind would also comply with all permit and regulatory requirements related to wetland and other WOTUS impacts, and the resources are expected to recover with mitigation. As a result, adverse impacts on wetland resources under the Proposed Action would be localized, short term **minor** adverse. O&M of the ICF and OnSS would not impact wetlands or other WOTUS. Project components would be demolished or decommissioned in place, limiting the potential for soils and materials to wash into adjacent wetland resources. Temporary **minor** adverse impacts to wetlands or other WOTUS adjacent to the structures could occur if debris from demolition washed into the adjacent wetland resources. Additional structures could cumulatively add to other onshore impacts due to an increase in impervious surface from reasonably foreseeable structures within the GAA. The Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in long-term **minor** adverse impacts to wetland resources.	**Onshore**: Alternatives C through F would have the same onshore activities and facilities as the Proposed Action, therefore impacts would be the same as those described for the Proposed Action: **minor** adverse.			

3.22.2.2 Alternative B: Impacts of the Proposed Action on Wetlands and Other Waters of the United States

3.22.2.2.1 Construction and Installation

Onshore Activities and Facilities

Accidental releases and discharges: Onshore construction and HDD activities would require heavy equipment use, and an inadvertent release from the machinery or spill during refueling activities could occur. Onshore cables would not contain fluids and would not be susceptible to leaks that could affect water quality. The drilling rig used for HDD would be located within the landfall envelope where there are no wetlands or other WOTUS. Drilling fluids and mud would be transported off-site for treatment, disposal, and/or reuse. Revolution Wind would prepare a construction-specific plan in accordance with applicable requirements and would outline spill prevention plans and steps to contain and clean up spills that may occur.

To protect water quality, all onshore activities would be conducted in compliance with the RI Pollutant Discharge Elimination System General Permit for the Discharge of Stormwater Associated with Construction Activities and an approved soil erosion and sedimentation control plan. The measures employed in the soil erosion and sedimentation control plan would minimize the opportunity for turbid discharges leaving a construction work area. The plan would also include specific measures for handling dewatering discharges and measures for refueling equipment to minimize the opportunities for uncontrolled spills. Therefore, with the implementation of these measures, accidental releases and discharges during onshore construction and installation are expected to result in short-term **minor** adverse impacts within adjacent wetland resources.

New cable emplacement/maintenance: No direct impacts to wetlands or other WOTUS would occur as a result of onshore cable emplacement or maintenance activities. The landfall work area, which would be used during cable emplacement, avoids the nearby freshwater forested wetland (Freshwater Wetland 1) and wetland buffer (see Table 3.22-1). The onshore cable route would follow Circuit Drive and Camp Avenue to the OnSS, and no wetlands or other WOTUS are within the cable route. However, approximately 94 feet (28.65 m) of the onshore cable route crosses the 50-foot buffer of Freshwater Wetland 1, resulting in 0.07 acre of temporary disturbance in the buffer. Temporary soil disturbance during cable installation could disturb and alter nearby wetland habitat, as well as potentially spread invasive species, which could lead to a small, localized reduction in habitat quality. With erosion control and weed management measures in place, any impacts to adjacent wetlands during construction and installation would be short term **negligible** adverse. The cable corridor would be fully restored once construction and installation is complete.

Presence of structures: Land disturbances from the presence of structures associated with Project construction and installation would include the 19.53-acre landfall work area, 7.04-acre OnSS, 3.76-acre ICF, and 16.58-acre onshore transmission cable envelope. The new OnSS and ICF would be constructed adjacent to the existing Davisville Substation to support interconnection of the Project to the existing electrical grid. These structures would permanently remove and replace 0.11 acre of freshwater forested wetland with impervious surface. This amounts to 2.6% of the 3.92 acres of delineated wetlands within the OnSS and ICF parcels, and less than 0.1% of mapped wetlands in the GAA (Lower West Passage subwatershed). There are no streams or other waterbodies within the footprint of the onshore facilities;

however, Mill Creek is adjacent to the OnSS. Freshwater wetlands and wetland buffers within onshore components are detailed in Table 3.22-1 and in Figures 4.3.1-3 and 4.3.1-13 in COP Appendix K. Approximately 0.11 acre of freshwater wetlands and 143.38 feet of an Area Subject to Stormwater Flowage—regulated ditch—would be directly impacted by construction and installation of the onshore facilities. Clearing, grading, and hardening in these areas could directly and indirectly impact wetland resources. Soil disturbance during construction and installation could also alter nearby wetland habitat due to sedimentation (see Section 3.21) and spread invasive species, leading to a small, localized reduction in habitat quality. Impacts to wetlands would be permitted and mitigated as described in Appendix F, resulting in recovery of the resource. Implementing EPMs such as erosion and sedimentation BMPs (see Table F-1 in Appendix F) would avoid or minimize impacts on water quality, wetlands, and WOTUS. Revolution Wind would also comply with all permit and regulatory requirements related to wetland and other WOTUS impacts, and the resources are expected to recover with mitigation. As a result, adverse impacts on wetland resources under the Proposed Action would be localized, short term **minor** adverse.

3.22.2.2.2 Operations and Maintenance and Decommissioning

Onshore Activities and Facilities

Accidental releases and discharges: The potential for accidental releases and discharges during O&M and decommissioning would be less than during construction and installation due to reduced use of drilling fluids, fuels, oils, and lubricants. The additional impervious surfaces at onshore Project facilities during O&M would increase the amount of runoff and stormwater pollutants delivered to nearby wetland resources. Wetlands are important habitats for supporting wildlife, and stormwater runoff filtration and stormwater runoff during O&M could have a short-term effect on turbidity and sediment deposition that could impact wetlands or other WOTUS. Revolution Wind would prepare a construction-specific spill plan in accordance with applicable requirements and would outline spill prevention training, plans, and steps to contain and clean up spills that may occur. Therefore, impacts to wetland resources from accidental releases and discharges would be short term **minor** adverse.

New cable emplacement/maintenance: If O&M activities related to the onshore cable are within the segment of the ROW that crosses the 50-foot buffer of Freshwater Wetland 1, then temporary soil disturbance could alter nearby wetland habitat and spread invasive species, leading to a reduction in habitat quality. Land disturbance during O&M would be limited to regular maintenance of underground infrastructure (i.e., transmission cable discussed above under Section 3.22.2.2.1), if needed, and EPMs would limit potential impacts from sedimentation. Adverse impacts on wetlands and WOTUS under the Proposed Action would be temporary **minor** adverse.

Presence of structures: For onshore facilities, no land disturbance is anticipated during regular maintenance. O&M of the ICF and OnSS would not impact wetlands or other WOTUS. During decommissioning of the ICF and OnSS facilities, the Project components would be demolished or decommissioned in place, limiting the potential for soils and materials to wash into adjacent wetland resources. Pre-existing habitats are not likely to be restored as part of decommissioning. Temporary **minor** adverse impacts to wetlands or other WOTUS adjacent to the structures could occur if debris from demolition washed into the adjacent wetland resources.

3.22.2.2.3 Cumulative Impacts

Onshore Activities and Facilities

Accidental releases and discharges: The Proposed Action could contribute construction-related accidental releases of fuel, fluids, or hazardous material; sediment; and/or trash and debris. The contribution from the Proposed Action would be a low percentage of the overall spill risk from ongoing and future activities in the GAA. These types of releases, if any, would occur infrequently at discrete locations in the watershed and at varied times. As a result, the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in short-term **negligible** adverse impacts to wetland resources.

Permitted routine operational effluent discharges to receiving waters are regulated by the NPDES. Any ballast water discharges from the Proposed Action and future offshore wind projects are not expected to affect wetland resources within the GAA. Stormwater runoff during O&M of onshore facilities could result in turbidity and sediment deposition that could cause short-term **minor** adverse impacts to wetlands or other WOTUS. Overall, the contribution to cumulative impacts to wetland resources is expected to be localized, temporary **minor** adverse.

New cable emplacement/maintenance: The contribution to cumulative impacts to wetland resources from anchoring and cable emplacement is expected to be the same as the Proposed Action because no other past, present, and reasonably foreseeable projects requiring cable placement/maintenance would occur within the GAA. As a result, the Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in **minor** adverse short-term impacts to wetlands and WOTUS due to surface disturbance in wetland buffers.

Presence of structures: The Proposed Action includes the OnSS and ICF structures that would remove and replace 0.11 acre of freshwater forested wetland with impervious surface, which is less than 0.1% of mapped wetlands in the GAA (Lower West Passage subwatershed) and 2.6% of wetlands delineated in those parcels. Additional structures could cumulatively add to other onshore impacts due to an increase in impervious surface from reasonably foreseeable structures within the GAA; however, only a small percentage of the 1,367.4 acres of freshwater wetlands are expected to be impacted. The Proposed Action, when combined with past, present, and reasonably foreseeable projects, would result in long-term **minor** adverse impacts to wetland resources.

3.22.2.2.4 Conclusions

Project construction and installation, O&M, and decommissioning would expose and disturb soils and sediments, resulting in potential erosion, sedimentation, or inadvertent release of contamination, hazardous materials or debris into onshore surface waters that could affect wetland resources in the GAA. BOEM anticipates the impacts resulting from the Proposed Action alone would range from **negligible** to **minor** adverse because the effect would be small and localized. Further, the resource would be expected to recover completely with remedial or mitigating action(s). The Proposed Action would not result in any net beneficial change to wetlands or other WOTUS.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under the Proposed Action resulting from individual IPFs would range from **negligible** to **minor** adverse. Considering all 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 impacts to wetlands and WOTUS because the effects are expected to be small and localized. Further, with implementation of EPMs, wetland resources are expected to recover completely.

3.22.2.3 Alternatives C, D, E, and F

Table 3.22-2 discloses IPF findings for each alternative.

3.22.2.3.1 Conclusions

Under Alternatives C through F, Project construction and installation, O&M, and decommissioning would expose and disturb soils and sediments, resulting in potential erosion, sedimentation, or inadvertent release of contamination, hazardous materials, or debris into onshore surface waters that could affect wetland resources in the GAA. BOEM anticipates that impacts resulting from each alternative alone would range from **negligible** to **minor** adverse because the effect would be small and localized. Further, the resource would be expected to recover completely with remedial or mitigating action(s). Alternatives C through F would not result in any net beneficial change to wetlands or other WOTUS.

In the context of other reasonably foreseeable environmental trends and planned actions, the impacts under Alternatives C through F resulting from individual IPFs would range from **negligible** to **minor** adverse. Considering all the IPFs together, BOEM anticipates that the overall impacts associated with each alternative, when combined with past, present, and reasonably foreseeable activities, would result in **minor** adverse impacts to wetlands and WOTUS because the effects are expected to be small and localized. Further, with implementation of EPMs, wetland resources are expected to recover completely.

3.22.2.4 Mitigation

No potential additional mitigation measures for wetland resources are identified in Table F-2 in Appendix F.

APPENDIX E3

Maximum-Case Scenario Estimates for Offshore Wind Projects

Contents

Tables

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Introduction

Table E3-1 (parts 1–10) provides maximum-case scenario estimates of potential offshore wind project impacts assuming maximum buildout, using the geographic analysis areas in the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) project environmental impact statement (EIS) and construction and operations plan–designated numbers for the RWF and RWEC. The Bureau of Ocean Energy Management (BOEM) developed these estimates based on offshore wind demand, as discussed in 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). Estimates disclosed in the EIS's Chapter 3, No Action analyses were developed by summing acreage or number calculations across all lease areas noted as occurring within, or overlapping, a given geographic analysis area. This likely overestimates some impacts in cases where lease areas only partially overlap analysis areas. However, this approach was used to provide the most conservative estimate of future offshore wind development.

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Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 1)

Region	Lease/Project/ Lease Remainder[1]	Status	Resource/Projects[3]							Estimated Offshore Construction Schedule[4]	Expected Turbine Size[5]
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/ Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice		
NE	NE Aquaventus (state waters)	State Project				X				2023	11 MW
NE	Block Island (state waters)	State Project, Built	X	X		X	X	X	X	Built	6 MW
	Total State Waters										
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD				X	X	X	X	2023	up to 14 MW
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	X	X		X	X	X	X	2023	6 - 12 MW
MA/RI	Sunrise, OCS-A 0487	COP, PPA	X	X		X	X	X	X	2024	11 MW
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	X			X	X	X	X	2024-2026	13 to 16 MW
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	X			X	X	X	X	2024-2026	13 to 19 MW
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA				X	X	X	X	2025	12 MW+
MA/RI	Beacon Wind, part of OCS-A 0520	PPA				X	X	X	X	2025-2026	12 MW
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	X	X		X	X	X	X	By 2030, spread over 2025-2030	12 MW
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.				X	X	X	X	By 2030, spread over 2025-2030	12 MW
MA/RI	OCS-A 0500 remainder[c]		X			X	X	X	X		
MA/RI	OCS-A 0487 remainder[c]		X	X		X	X	X	X		
MA/RI	OCS-A 0520 remainder					X	X	X	X		
	Remaining MA/RI Lease Area Total[2]	88%									
	Total MA/RI Leases (without Proposed Actions)[2]										
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA				X			X	2023-2024	12 MW
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA				X			X	2024-2025	10 - 18 MW
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA				X			X	2023-2027	
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA				X			X	2025-2027	>12 MW
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA				X			X	By 2030, spread over 2026-2030	12 MW
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)					X			X	By 2030, spread over 2026-2030	12 MW
NY/NJ	Central Bight, OCS-A 0537					X			X	By 2030, spread over 2026-2030	12 MW
NY/NJ	Hudson South B, OCS-A 0538					X			X		12 MW
NY/NJ	Hudson South C, OCS-A 0539					X			X		12 MW
NY/NJ	Hudson South E, OCS-A 0541					X			X		12 MW
NY/NJ	Hudson South F, OCS-A 0542					X			X		12 MW
NY/NJ	Hudson North, OCS-A 0544					X			X		12 MW
	TOTAL NY/NJ LEASES										
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA				X			X	2024	12 MW
DE/MD	US Wind, part of OCS-A 0490	COP, PPA				X			X	2024	8.6 - 12 MW
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.				X			X	By 2030, spread over 2023-2030	12 MW
DE/MD	OCS-A 0519 remainder					X			X		12 MW

Region	Lease/Project/ Lease Remainder[1]	Status	Resource/Projects[3] Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/ Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Estimated Offshore Construction Schedule[4]	Expected Turbine Size[5]
	Remaining DE/MD Lease Area Total					X			X		
	TOTAL DE/MD LEASES										
VA/NC	CVOW, OCS-A 0497	Built				X			X	Built	6 MW
VA/NC	CVOW-C, OCS-A 0483	COP				X			X	2024-2025	14-16 MW
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP				X			X	2025-2026	14-18 MW
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)				X			X	2026-2027	14-18 MW
	TOTAL VA/NC LEASES										
	OCS Total (without Proposed Action)[24, 25]:										

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 2)

Region	Lease/Project/ Lease Remainder[1]	Status	Generating Capacity (MW) (INTERNAL NOTE - FULL MW)							Generating Capacity (MW)							Offshore Export Cable Length (Statute Miles)[8]	Offshore Export Cable Installation Tool Disturbance Width (feet)	Inter-array Cable Length (Statute Miles)[9]
			Air[6]	Water[7]	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air[6]	Water[7]	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice			
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	11	NA	NA	NA	NA	NA	NA	11	NA	NA	NA			
NE	Block Island (state waters)	State Project, Built	30	30	NA	30	30	30	30	30	30	NA	30	30	30	30	28	5	2
	Total State Waters		**30**	**30**	**NA**	**41**	**30**	**30**	**30**	**30**	**30**	**NA**	**41**	**30**	**30**	**30**	**28**	**5**	**2**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	800	800	800	800	NA	NA	NA	800	800	800	800	98	6.5	171
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	130	130	130	130	130	130	130	130	130	130	130	130	130	130	139	6.5	24
MA/RI	Sunrise, OCS-A 0487	COP, PPA	1122	1122	NA	1122	1122	1122	1122	1122	1122	NA	1122	1122	1122	1122	106	6.5	180
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	804	NA	NA	804	804	804	804	804	NA	NA	804	804	804	804	125	10	139
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	1500	NA	NA	1500	1500	1500	1500	1,500	NA	NA	1500	1500	1500	1500	225	10	201
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	804	804	804	804	NA	NA	NA	804	804	804	804	744	6.5	497
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA	1,230	1,230	1,230	1,230	NA	NA	NA	1,230	1,230	1,230	1,230	120	6.5	163.08
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	1,09 2	1,092	NA	1,092	1,092	1,092	1,092	1,092	1,092	NA	1,092	1,092	1,092	1,092	120	6.5	171.96
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	NA	NA	NA	4,200	4,200	948	4,192	NA	NA	NA	3,876	3,876	948	3,876	120	6.5	504.96
MA/RI	OCS-A 0500 remainder[c]		852	120	NA			3,876		71	10	NA					120		
MA/RI	OCS-A 0487 remainder[c]		48	48	NA			3,876		48	48	NA					120		
MA/RI	OCS-A 0520 remainder		NA	NA	NA			3,876		NA	NA	NA					120		

Region	Lease/Project/ Lease Remainder[1]	Status	Generating Capacity (MW) (INTERNAL NOTE - FULL MW)							Generating Capacity (MW)							Offshore Export Cable Length (Statute Miles)[8]	Offshore Export Cable Installation Tool Disturbance Width (feet)	Inter-array Cable Length (Statute Miles)[9]
			Air[6]	Water[7]	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air[6]	Water[7]	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice			
	Remaining MA/RI Lease Area Total[2]	88%	48	120	NA					4,767	2,402	NA			948		600	6.5	677
	Total MA/RI Leases (without Proposed Actions)[2]		**5,596**	**2,632**	**130**	**11,682**	**11,682**	**20,058**	**11,674**	**4,767**	**2,402**	**130**	**11,358**	**11,358**	**8,430**	**11,358**	**2,157**	**NA**	**2,052**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA				1,100			1,100	NA	NA	NA	1,100	NA	NA	1,100	142	5	142
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA				816			816	NA	NA	NA	816	NA	NA	816	40	7	116
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA				1,260			1,260	NA	NA	NA	1,260	NA	NA	1,260	26	7	144
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA				1,510			1,510	NA	NA	NA	1,510	NA	NA	1,510	342	13	584
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA				1,554			1554	NA	NA	NA	1,554	NA	NA	1,554	120	5	173
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)					2,198			2,198	NA	NA	NA	2,198	NA	NA	2,198	120	7	242
NY/NJ	Central Bight, OCS-A 0537					868			868	NA	NA	NA	868	NA	NA	868	120	5	120
NY/NJ	Hudson South B, OCS-A 0538					964			964	NA	NA	NA	964	NA	NA	964	120	5	120
NY/NJ	Hudson South C, OCS-A 0539					1,387			1,387	NA	NA	NA	1,387	NA	NA	1,387	120	5	120
NY/NJ	Hudson South E, OCS-A 0541					924			924	NA	NA	NA	924	NA	NA	924	120	5	120
NY/NJ	Hudson South F, OCS-A 0542					934			934	NA	NA	NA	934	NA	NA	934	120	5	120
NY/NJ	Hudson North, OCS-A 0544					523			523	NA	NA	NA	523	NA	NA	523	120	5	120
	TOTAL NY/NJ LEASES					**14,038**			**14,038**	NA	NA	NA	**14,038**	**NA**	NA	**14,038**	**1510**		**2121**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA				120			120	NA	NA	NA	120	NA	NA	120	40	10	30
DE/MD	US Wind, part of OCS-A 0490	COP, PPA				1500			1500	NA	NA	NA	1500	NA	NA	1500	190	6.5	151
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.				1,080			1,080	NA	NA	NA	1,080	NA	NA	1,080	n.d	n.d	n.d
DE/MD	OCS-A 0519 remainder									NA	NA	NA		NA	NA		n.d.	n.d	n.d
	Remaining DE/MD Lease Area Total									NA	NA	NA		NA	NA		240	5	139
	TOTAL DE/MD LEASES					**2,700**			**2700**	NA	NA	NA	**2,700**	NA	NA	**2,700**	**470**		**320**
VA/NC	CVOW, OCS-A 0497	Built				12			12	NA	NA	NA	12	NA	NA	12	27	3.3	9
VA/NC	CVOW-C, OCS-A 0483	COP				3,000			3000	NA	NA	NA	3,000	NA	NA	3,000	417	5	301
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP				1,242			1,242	NA	NA	NA	1,242	NA	NA	1,242	112	6.5	149
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)				1,242			1,242	NA	NA	NA	1,242	NA	NA	1,242	200	6.5	149
	TOTAL VA/NC LEASES					**5,496**			**5,496**	NA	NA	NA	**5,496**	NA	NA	**5,496**	**756**	**NA**	**608**
	OCS Total (without Proposed Action)[24, 25]:		**5,626**	**2,662**	**130**	**33,957**	**11,712**	**20,088**	**33,938**	**4,797**	**2,432**	**130**	**33,633**	**11,388**	**8,460**	**33,622**	**4,921**	**NA**	**5,103**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 3)

Region	Lease/Project/ Lease Remainder[1]	Status	Hub Height (Feet)[10]							Rotor Diameter (Feet)[11]							Total Height of Turbine (Feet)[12]						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA					NA	NA	NA	450	450	450	450	NA	NA	NA	520	520	520	520
NE	Block Island (state waters)	State Project, Built	NA	NA	NA	328	328	328	328	NA	NA	NA	541	541	541	541	NA	NA	NA	659	659	659	659
	Total State Waters		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	451	451	451	451	NA	NA	NA	721	721	721	721	NA	NA	NA	812	812	812	812
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	358	358	NA	358	358	358	358	543	543	543	543	543	722	722	614	614	614	614	614	853	853
MA/RI	Sunrise, OCS-A 0487	COP, PPA	459	459	NA	459	459	459	459	656	656	NA	656	656	656	656	787	787	NA	787	787	787	787
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	630	NA	NA	630	630	630	630	837	NA	NA	837	837	837	837	1047	NA	NA	1047	1047	1047	1047
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	702	NA	NA	702	702	702	702	935	NA	NA	935	935	935	935	1171	NA	NA	1171	1171	1171	1171
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	605	605	605	605	NA	NA	NA	919	919	919	919	NA	NA	NA	1066	1066	1066	1066
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA	492	492	492	492	NA	NA	NA	722	722	722	722	NA	NA	NA	853	853	853	853
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	492	492	NA	492	492	492	492	722	722	NA	722	722	722	722	853	853	NA	853	853	853	853
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	NA	NA	NA	492	492	492	492	NA	NA	NA	722	722	722	722	NA	NA	NA	853	853	853	853
MA/RI	OCS-A 0500 remainder[c]		492	492	NA	492	492	492	492	722	722	NA	722	722	722	722	853	853	NA	853	853	853	853
MA/RI	OCS-A 0487 remainder[c]		NA	NA	NA	492	492	492	492	NA	NA	NA	722	722	722	722	NA	NA	NA	853	853	853	853
MA/RI	OCS-A 0520 remainder		NA	NA	NA	492	492	492	492	NA	NA	NA	722	722	722	722	NA	NA	NA	853	853	853	853
	Remaining MA/RI Lease Area Total[2]	88%	NA	NA	NA	492	492	492	492	NA	NA	NA	722	722	722	722	NA	NA	NA	853	853	853	853
	Total MA/RI Leases (without Proposed Actions)[2]		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	NA	512	NA	NA	512	NA	NA	NA	788	NA	NA	788	NA	NA	NA	906	NA	NA	906
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	NA	525	NA	NA	525	NA	NA	NA	853	NA	NA	853	NA	NA	NA	951	NA	NA	951
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	NA	525	NA	NA	525	NA	NA	NA	853	NA	NA	853	NA	NA	NA	951	NA	NA	951
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	NA	576	NA	NA	576	NA	NA	NA	919	NA	NA	919	NA	NA	NA	1049	NA	NA	1049
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	NA	512	NA	NA	512	NA	NA	NA	788	NA	NA	788	NA	NA	NA	906	NA	NA	906
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	NA	576	NA	NA	576	NA	NA	NA	919	NA	NA	919	NA	NA	NA	1049	NA	NA	1049
NY/NJ	Central Bight, OCS-A 0537		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
NY/NJ	Hudson North, OCS-A 0544		NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
	TOTAL NY/NJ LEASES																						
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	NA	492	NA	NA	492	NA	NA	NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	NA	440	NA	NA	440	NA	NA	NA	722	NA	NA	722	NA	NA	NA	801	NA	NA	801
DE/MD	GSOE I, OCS-A 0482		NA	NA	NA	492	NA	NA	492	NA		NA	722	NA	NA	722	NA	NA	NA	853	NA	NA	853

Region	Lease/Project/ Lease Remainder[1]	Status	Hub Height (Feet)[10]							Rotor Diameter (Feet)[11]							Total Height of Turbine (Feet)[12]						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/ Recreation-Tourism	Demographics/ Environmental Justice
DE/MD	OCS-A 0519 remainder	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	NA		NA	NA		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	n.d.	NA	NA	n.d.
	TOTAL DE/MD LEASES		NA	NA	NA	**NA**	NA	NA	**NA**	NA	NA	NA	**NA**	NA	NA	**NA**	NA	NA	NA	**NA**	NA	NA	**NA**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	NA	364	NA	NA	364	NA	NA	NA	506	NA	NA	506	NA	NA	NA	620	NA	NA	620
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	NA	482	NA	NA	482	NA	NA	NA	761	NA	NA	761	NA	NA	NA	869	NA	NA	869
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	NA	472	NA	NA	574	NA	NA	NA	728	NA	NA	935	NA	NA	NA	837	NA	NA	1042
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	NA	472	NA	NA	574	NA	NA	NA	728	NA	NA	935	NA	NA	NA	837	NA	NA	1042
	TOTAL VA/NC LEASES		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	OCS Total (without Proposed Action)[24, 25]:		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 4)

Region	Lease/Project/ Lease Remainder[1]	Status	Turbine Number[13]							Estimated Foundation Number[14]							Total Footprint of Foundations[15] (Acres)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	2	2	NA	2	2	2	2	2	2		2	2	2	2	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	5	5	NA	5	5	5	5	5	5		5	5	5	5	NA	NA	NA	1	1	1	1
	Total State Waters		**7**	**7**	**NA**	**7**	**7**	**7**	**7**	**7**	**7**		**7**	**7**	**7**	**7**	**NA**	**NA**	**NA**	**1**	**NA**	**NA**	**1**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	62	62	62	62	NA	NA	NA	63	63	63	63	NA	NA	NA	1.3	1.3	1.3	1.3
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	12	12	12	12	12	12	12	13	13	13	13	13	13	13	1	1	1	1	1	1	1
MA/RI	Sunrise, OCS-A 0487	COP, PPA	102	102	NA	102	102	102	102	103	103	NA	103	103	103	103	3	3	NA	3	3	3	3
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	5	NA	NA	62	62	62	62	5	NA	NA	64	64	64	64	0.13	NA	NA	1.7	1.7	1.7	1.7
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	79	NA	NA	79	79	79	79	82	NA	NA	82	82	82	82	2.7	NA	NA	2.7	2.7	2.7	2.7
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	147	147	147	147	NA	NA	NA	149	149	149	149	NA	NA	NA	139	139	139	139
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA	103	103	103	103	NA	NA	NA	106	106	106	106	NA	NA	NA	5	5	5	5
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	91	65	NA	110	110	110	110	93	67	NA	112	112	112	112	9.3	6.7	NA	11	11	11	11
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the	NA	NA	NA	323	323	34	323	NA	NA	NA	337	337	35	337	NA	NA	NA	33.7	33.7	3.5	33.7
MA/RI	OCS-A 0500 remainder[c]		71	10	NA			218		73	11	NA			219		7.3	1.1	NA			22	
MA/RI	OCS-A 0487 remainder[c]		4	4	NA					4	4	NA					0.4	0.4	NA				

Region	Lease/Project/ Lease Remainder[1]	Status	Turbine Number[13]							Estimated Foundation Number[14]							Total Footprint of Foundations[15] (Acres)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
MA/RI	OCS-A 0520 remainder	remaining technical capacity is 4,764 MW.	NA	NA	NA					NA	NA	NA					NA	NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	166	79	0	433	433	362	433	170	82	NA	449	449	366	449	17.0	8.2	0	45	45	37	45
	Total MA/RI Leases (without Proposed Actions)[2]		**364**	**193**	**12**	**1,000**	**1,000**	**929**	**1,000**	**373**	**198**	**13**	**1,029**	**1,029**	**946**	**1,029**	**23**	**12**	**1**	**199**	**199**	**190**	**199**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	NA	98	NA	NA	98	NA	NA	NA	101	NA	NA	101	NA	NA	NA	4	NA	NA	4
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	NA	71	NA	NA	71	NA	NA	NA	72	NA	NA	72	NA	NA	NA	42	NA	NA	42
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	NA	103	NA	NA	103	NA	NA	NA	104	NA	NA	104	NA	NA	NA	61	NA	NA	61
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	NA	200	NA	NA	200	NA	NA	NA	210	NA	NA	210	NA	NA	NA	9	NA	NA	9
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	NA	111	NA	NA	111	NA	NA	NA	113	NA	NA	113	NA	NA	NA	5	NA	NA	5
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	NA	157	NA	NA	157	NA	NA	NA	159	NA	NA	159	NA	NA	NA	7	NA	NA	7
NY/NJ	Central Bight, OCS-A 0537		NA	NA	NA	72	NA	NA	72	NA	NA	NA	74	NA	NA	74	NA	NA	NA	7	NA	NA	7
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	NA	80	NA	NA	80	NA	NA	NA	82	NA	NA	82	NA	NA	NA	8	NA	NA	8
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	NA	116	NA	NA	116	NA	NA	NA	118	NA	NA	118	NA	NA	NA	12	NA	NA	12
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	NA	77	NA	NA	77	NA	NA	NA	79	NA	NA	79	NA	NA	NA	8	NA	NA	8
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	NA	78	NA	NA	78	NA	NA	NA	80	NA	NA	80	NA	NA	NA	8	NA	NA	8
NY/NJ	Hudson North, OCS-A 0544		NA	NA	NA	44	NA	NA	44	NA	NA	NA	45	NA	NA	45	NA	NA	NA	4	NA	NA	4
	TOTAL NY/NJ LEASES		NA	NA	NA	**1207**	NA	NA	**1207**	NA	NA	NA	**1237**	NA	NA	**1237**	NA	NA	NA	**174**	**NA**	**NA**	**174**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	NA	16	NA	NA	16	NA	NA	NA	17	NA	NA	17	NA	NA	NA	0.7	NA	NA	0.7
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	NA	125	NA	NA	125	NA	NA	NA	129	NA	NA	129	NA	NA	NA	5	NA	NA	5
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	NA	90	NA	NA	90	NA	NA	NA	93	NA	NA	93	NA	NA	NA	3.7	NA	NA	3.7
DE/MD	OCS-A 0519 remainder		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	NA	90	NA	NA	90	NA	NA	NA	93	NA	NA	93	NA	NA	NA	4	NA	NA	4
	TOTAL DE/MD LEASES		NA	NA	NA	**321**	NA	NA	**321**	NA	NA	NA	**332**	NA	NA	**332**	NA	NA	NA	**13**	NA	NA	**13**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	NA	2	NA	NA	2	NA	NA	NA	2	NA	NA	2	NA	NA	NA	0.1	NA	NA	0.1
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	NA	205	NA	NA	205	NA	NA	NA	208	NA	NA	208	NA	NA	NA	8	NA	NA	8
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	NA	69	NA	NA	69	NA	NA	NA	70	NA	NA	70	NA	NA	NA	3	NA	NA	3
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	NA	121	NA	NA	121	NA	NA	NA	123			123	NA	NA	NA	5	NA	NA	5
	TOTAL VA/NC LEASES		NA	NA	NA	**397**	NA	NA	**397**	NA	NA	NA	**403**	NA	NA	**403**	NA	NA	NA	**16**	NA	NA	**16**
	OCS Total (without Proposed Action)[24, 25]:		**371**	**200**	**12**	**2,932**	**1,007**	**936**	**2,932**	**380**	**205**	**13**	**3,008**	**1,036**	**953**	**3,008**	**23**	**12**	**1**	**403**	**199**	**190**	**403**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 5)

Region	Lease/Project/ Lease Remainder[1]	Status	Seabed Disturbance Based on Addition of Scour Protection (Foundation+Scour Protection) (Acres)[16]							Offshore Export Cable Seabed Disturbance (Acres)[17]						Offshore Export Cable Operating Seabed Footprint (Acres)[18]					
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	NA	NA	NA	6	6	6	6	11.61	NA	11.61	11.61	11.61	11.61	11.61	NA	11.61	11.61	11.61	11.61
	Total State Waters		**NA**	**NA**	**NA**	**6**	**6**	**6**	**6**	**11.61**	**NA**	**11.61**	**11.61**	**11.61**	**11.61**	**11.61**	**NA**	**11.61**	**11.61**	**11.61**	**11.61**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	32.7	32.7	32.7	32.7	NA	NA	69	69	69	69	NA	NA	77	77	77	77
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	11	11	11	11	11	11	11	555	555	555	555	555	555	7	7	7	7	7	7
MA/RI	Sunrise, OCS-A 0487	COP, PPA	108	108	NA	108	108	108	108	1,259	NA	1,259	1,259	1,259	1,259	84	NA	102	102	102	102
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	6.7	NA	NA	86	86	86	86	NA	NA	263	263	263	263	NA	NA	22	22	22	22
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	98	NA	NA	98	98	98	98	NA	NA	243	243	243	243	NA	NA	32	32	32	32
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	1,697	1,697	1,697	1,697	NA	NA	2,480	2,480	2,480	2,480	NA	NA	586	586	586	586
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA	265	265	265	265	NA	NA	143	143	143	143	NA	NA	95	95	95	95
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	93	67	NA	112	112	112	112	NA	NA	143	143	143	143	NA	NA	95	95	95	95
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	NA	NA	NA	337	337	35	337	NA	NA	713	713	856	713	NA	NA	473	473	567	473
MA/RI	OCS-A 0500 remainder[c]		73	11	NA			219		150	NA					48	NA				
MA/RI	OCS-A 0487 remainder[c]		4	4	NA					150	NA					48	NA				
MA/RI	OCS-A 0520 remainder		NA	NA	NA					NA	NA					NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	170	82	0	449	449	366	449	300	NA	856	856	999	856	96	NA	567	567	662	567
	Total MA/RI Leases (without Proposed Actions)[2]		**394**	**201**	**11**	**2,747**	**2,747**	**2,664**	**2,747**	**2,114**	**555**	**5,868**	**5,868**	**6,011**	**5,868**	**187**	**7**	**1,488**	**1,488**	**1,583**	**1,488**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	NA	80	NA	NA	80	NA	NA	169	NA	NA	169	NA	NA	86	NA	NA	86
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	NA	645	NA	NA	645	NA	NA	50	NA	NA	50	NA	NA	16	NA	NA	16
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	NA	936	NA	NA	936	NA	NA	33	NA	NA	33	NA	NA	10	NA	NA	10
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	NA	135	NA	NA	135	NA	NA	427	NA	NA	427	NA	NA	137	NA	NA	137
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	NA	96	NA	NA	96	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	NA	135	NA	NA	135	NA	NA	124	NA	NA	124	NA	NA	40	NA	NA	40
NY/NJ	Central Bight, OCS-A 0537		NA	NA	NA	74	NA	NA	74	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	NA	82	NA	NA	82	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	NA	118	NA	NA	118	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	NA	79	NA	NA	79	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	NA	80	NA	NA	80	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
NY/NJ	Hudson North, OCS-A 0544		NA	NA	NA	45	NA	NA	45	NA	NA	150	NA	NA	150	NA	NA	48	NA	NA	48
	TOTAL NY/NJ LEASES		**NA**	**NA**	**NA**	**2505**	**NA**	**NA**	**2505**	**NA**	**NA**	**1853**	**NA**	**NA**	**1853**	**NA**	**NA**	**625**	**NA**	**NA**	**625**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	NA	14	NA	NA	14	NA	NA	48	NA	NA	48	NA	NA	50	NA	NA	50
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	NA	110	NA	NA	110	NA	NA	226	NA	NA	226	NA	NA	150	NA	NA	150

Region	Lease/Project/ Lease Remainder[1]	Status	Seabed Disturbance Based on Addition of Scour Protection (Foundation+Scour Protection) (Acres)[16]							Offshore Export Cable Seabed Disturbance (Acres)[17]						Offshore Export Cable Operating Seabed Footprint (Acres)[18]					
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	NA	79.05	NA	NA	79.05	NA	NA	286	NA	NA	286	NA	NA	145	NA	NA	145.455
DE/MD	OCS-A 0519 remainder		NA	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	NA	79	NA	NA	79	NA	NA	286	NA	NA	286	NA	NA	145	NA	NA	145
	TOTAL DE/MD LEASES		NA	NA	NA	**282**	NA	**NA**	**282**	NA	NA	**846**	**NA**	**NA**	**846**	NA	NA	**491**	**NA**	**NA**	**491**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	NA	2	NA		2	NA	NA	33	NA	NA	33	NA	NA	11	NA	NA	11
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	NA	177	NA	NA	177	NA	NA	1,971	NA	NA	1,971	NA	NA	253	NA	NA	253
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	NA	60	NA	NA	60	NA	NA	134	NA	NA	134	NA	NA	88	NA	NA	88
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	NA	105	NA	NA	104.55	NA	NA	238	NA	NA	238	NA	NA	158	NA	NA	158
	TOTAL VA/NC LEASES		NA	NA	NA	**343**	NA	**NA**	**343**	**NA**	**NA**	**2,376**	**NA**	**NA**	**2,376**	**NA**	**NA**	**509**	**NA**	**NA**	**509**
	OCS Total (without Proposed Action)[24, 25]:		**394**	**201**	**11**	**5,883**	**2,753**	**2,670**	**5,883**	**2,126**	**555**	**10,954**	**5,880**	**6,023**	**10,954**	**198**	**7**	**3,126**	**1,500**	**1,595**	**3,126**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 6)

Region	Lease/Project/ Lease Remainder[1]	Status	Offshore Export Cable Hard Protection (Acres)[19]						Anchoring Disturbance (Acres)[20]						Inter-array Construction Footprint/ Seabed Disruption (Acres)[21]					
			Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	NA	NA	NA	NA	NA	NA	0.5	NA	0.5	0.5	0.5	0.5	12	NA	4	4	4	4
	Total State Waters		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**0.5**	**NA**	**0.5**	**0.5**	**0.5**	**0.5**	**12**	**NA**	**4**	**NA**	**4**	**4**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	35	35	35	35	NA	NA	4	4	4	4	NA	NA	129	129	129	129
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	7	7	7	7	7	7	663	663	663	663	663	663	340	340	340	340	340	340
MA/RI	Sunrise, OCS-A 0487	COP, PPA	25	NA	25	25	25	25	11	NA	11	11	11	11	462	NA	462	462	462	462
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	NA	NA	22	22	22	22	NA	NA	34	34	34	34	NA	NA	222	222	222	222
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	NA	NA	32	32	32	32	NA	NA	50	50	50	50	NA	NA	321	321	321	321
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	471	471	471	471	NA	NA	442	442	442	442	NA	NA	1408	1408	1408	1408
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	43	43	43	43	NA	NA	442	442	442	442	NA	NA	247	247	247	247
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	NA	NA	43	43	43	43	NA	NA	442	442	442	442	160.8	NA	264	264	218	264
MA/RI	Liberty Wind (OCS-A 0522)		NA	NA	214	214	257	214	NA	NA	60	60	72	60	NA	NA	775	775	775	775

Region	Lease/Project/ Lease Remainder[1]	Status	Offshore Export Cable Hard Protection (Acres)[19]						Anchoring Disturbance (Acres)[20]						Inter-array Construction Footprint/ Seabed Disruption (Acres)[21]					
			Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
MA/RI	OCS-A 0500 remainder[c]	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	4.3	NA					12	NA					24	NA				
MA/RI	OCS-A 0487 remainder[c]		4.3	NA					12	NA					10	NA				
MA/RI	OCS-A 0520 remainder		NA	NA					NA	NA					NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	9	NA	257	257	300	257	24	NA	502	502	514	502	194	0	1,039	1,039	993	1,039
	Total MA/RI Leases (without Proposed Actions)[2]		**41**	**7**	**892**	**892**	**935**	**892**	**698**	**663**	**2,148**	**2,148**	**2,160**	**2,148**	**996**	**340**	**4,168**	**4,168**	**4,121**	**4,168**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	51	NA	NA	51	NA	NA	14	NA	NA	14	NA	NA	221	NA	NA	221
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	14	NA	NA	14	NA	NA	4	NA	NA	4	NA	NA	173	NA	NA	173
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	9	NA	NA	9	NA	NA	3	NA	NA	3	NA	NA	250	NA	NA	250
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	12	NA	NA	12	NA	NA	262	NA	NA	262	NA	NA	504	NA	NA	504
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	271	NA	NA	271
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	35	NA	NA	35	NA	NA	10	NA	NA	10	NA	NA	382	NA	NA	382
NY/NJ	Central Bight, OCS-A 0537		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	173	NA	NA	173
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	197	NA	NA	197
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	283	NA	NA	281
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	190	NA	NA	190
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	187	NA	NA	185
NY/NJ	Hudson North, OCS-A 0544		NA	NA	43	NA	NA	43	NA	NA	12	NA	NA	12	NA	NA	105	NA	NA	103
	TOTAL NY/NJ LEASES		**NA**	**NA**	**422**	**NA**	**NA**	**422**	**NA**	**NA**	**377**	**NA**	**NA**	**377**	**NA**	**NA**	**2,935**	**NA**	**NA**	**2,929**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	14	NA	NA	14	NA	NA	4	NA	NA	4	NA	NA	38	NA	NA	38
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	68	NA	NA	68	NA	NA	19	NA	NA	19	NA	NA	300	NA	NA	300
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	85.68	NA	NA	85.68	NA	NA	24	NA	NA	24	NA	NA	216	NA	NA	216
DE/MD	OCS-A 0519 remainder		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	86	NA	NA	86	NA	NA	24	NA	NA	24	NA	NA	216	NA	NA	216
	TOTAL DE/MD LEASES		NA	NA	**253**	**NA**	**NA**	**253**	NA	NA	**71**	**NA**	**NA**	**71**	NA	NA	**770**	**NA**	**NA**	**770**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	10	NA	NA	10	NA	NA	3	NA	NA	3	NA	NA	5	NA	NA	5
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	42	NA	NA	42	NA	NA	42	NA	NA	42	NA	NA	1781	NA	NA	1781
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	40	NA	NA	40	NA	NA	11	NA	NA	11	NA	NA	166	NA	NA	166
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	71	NA	NA	71	NA	NA	20	NA	NA	20	NA	NA	290	NA	NA	290
	TOTAL VA/NC LEASES		**NA**	**NA**	**163**	**NA**	**NA**	**162**	**NA**	**NA**	**76**	**NA**	**NA**	**76**	**NA**	**NA**	**2242**	**NA**	**NA**	**2242**
	OCS Total (without Proposed Action)[24, 25]:		**41**	**7**	**1,730**	**892**	**935**	**1730**	**698**	**1,326**	**2,672**	**2,148**	**2,160**	**2,672**	**1,008**	**340**	**10,119**	**4,168**	**4,125**	**10,113**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 7)

Region	Lease/Project/ Lease Remainder[1]	Status	Inter-array Operating Footprint/ Seabed Disruption (Acres)[22]						Inter-array Cable Hard Protection (Acres)[23]						Total of Coolant fluids in WTGs (gallons)						
			Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	7.15	NA	7.15	7.15	7.15	7.15	0.00	NA	0.00	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	NA
	Total State Waters		**7.15**	**NA**	**7.15**	**NA**	**7.15**	**7.15**	**0.00**	**NA**	**0.00**	**0.00**	**0.00**	**0.00**	NA	NA	NA	NA	NA	NA	NA
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	90	90	90	90	NA	NA	22.491	22.491	22.5	22.491	NA	NA	NA	42,300	42,300	42,300	42,300
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	19	19	19	19	19	19	20.2	20.2	20.2	20.2	20.2	20.2	41208	41208	NA	41208	41208	41208	41208
MA/RI	Sunrise, OCS-A 0487	COP, PPA	145	NA	145	145	145	145	129	NA	129	129	129	129	350,268	350,268	NA	350,268	350,268	350,268	350,268
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	NA	NA	92	92	92	92	NA	NA	129	129	129	129	25,360	NA	NA	314,470	314,470	314,470	314,470
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	NA	NA	117	117	117	117	NA	NA	14	14	14	14	72,277	NA	NA	475,826	475,826	475,826	475,826
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	213	213	213	213	NA	NA	122	122	122	122	NA	NA	NA	73,500	73,500	73,500	73,500
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	152	152	152	152	NA	NA	152	152	152	152	NA	NA	NA				
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)	132.99	NA	160	160	133	160	NA	NA	0	0	0	0							
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	NA	NA	482	482	482	482	NA	NA	0	0	0	0	NA	NA	NA	136,629	136,629	136,629	136,629
MA/RI	OCS-A 0500 remainder[c]		14.3	NA					0	NA					30,033	4,230	NA				
MA/RI	OCS-A 0487 remainder[c]		6	NA					0	NA					1,692	1,692	NA				
MA/RI	OCS-A 0520 remainder		NA	NA					NA	NA					NA	NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	153	0	642	642	615	642	0	NA	0	0	0	0	70,218	33,417	0	183,159	183,159	183,159	183,159
	Total MA/RI Leases (without Proposed Actions)[2]		**317**	**19**	**1,470**	**1,470**	**1,443**	**1,470**	**149**	**20**	**588**	**588**	**589**	**588**	**559,331**	**424,893**	**0**	**1,480,731**	**1,480,731**	**1,480,731**	**1,480,731**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	134	NA	NA	134	NA	NA	0	NA	NA	0	NA	NA	NA	39,690	NA	NA	39,690
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	103	NA	NA	103	NA	NA	0	NA	NA	0	NA	NA	NA	61,912	NA	NA	61912
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	149	NA	NA	149	NA	NA	0	NA	NA	0	NA	NA	NA	89,816	NA	NA	89816
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	317	NA	NA	317	NA	NA	0	NA	NA	0	NA	NA	NA	820,000	NA	NA	820,000
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	162	NA	NA	162	NA	NA	0	NA	NA	0	NA	NA	NA	44,953	NA	NA	44,953
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	239	NA	NA	239	NA	NA	0	NA	NA	0	NA	NA	NA	643,700	NA	NA	643,700
NY/NJ	Central Bight, OCS-A 0537		NA	NA	106	NA	NA	106	NA	NA	0	NA	NA	0	NA	NA	NA	47,790	NA	NA	47,790
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	115	NA	NA	114	NA	NA	0	NA	NA	0	NA	NA	NA	36,450	NA	NA	36,450
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	165	NA	NA	166	NA	NA	0	NA	NA	0	NA	NA	NA	34,020	NA	NA	34,020
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	110	NA	NA	110	NA	NA	0	NA	NA	0	NA	NA	NA	38,475	NA	NA	38,475
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	111	NA	NA	112	NA	NA	0	NA	NA	0	NA	NA	NA	38,070	NA	NA	38,070
NY/NJ	Hudson North, OCS-A 0544		NA	NA	62	NA	NA	63	NA	NA	0	NA	NA	0	NA	NA	NA	25,515	NA	NA	25,515
	TOTAL NY/NJ LEASES		**NA**	**NA**	**1774**	**NA**	**NA**	**1775**	**NA**	NA	**0**	**NA**	**NA**	**0**	**NA**	**NA**	**NA**	**1,920,391**	**NA**	**NA**	**1,920,391**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	24	NA	NA	24	NA	NA	0	NA	NA	0	NA	NA	NA	6,768	NA	NA	6,768
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	184	NA	NA	184	NA	NA	0	NA	NA	0	NA	NA	NA	52,875	NA	NA	52,875

Region	Lease/Project/ Lease Remainder[1]	Status	Inter-array Operating Footprint/ Seabed Disruption (Acres)[22]						Inter-array Cable Hard Protection (Acres)[23]						Total of Coolant fluids in WTGs (gallons)						
			Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	481.91	NA	NA	481.91	NA	NA	0	NA	NA	0	NA	NA	NA	38070	NA	NA	38070
DE/MD	OCS-A 0519 remainder		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	482	NA	NA	482	NA	NA	0	NA	NA	0	NA	NA	NA	38,070	NA	NA	38070
	TOTAL DE/MD LEASES		NA	NA	**1173**	**NA**	**NA**	**1173**	NA	NA	**0**	**NA**	**NA**	**0**	**NA**	**NA**	**NA**	**135,783**	**NA**	**NA**	**135,783**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	3	NA	NA	3	NA	NA	0	NA	NA	0	NA	NA	NA	846	NA	NA	846
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	297	NA	NA	297	NA	NA	0	NA	NA	0	NA	NA	NA	86,715	NA	NA	86715
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	100	NA	NA	100	NA	NA	0	NA	NA	0	NA	NA	NA	29,187	NA	NA	29,187
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	176	NA	NA	176	NA	NA	0	NA	NA	0	NA	NA	NA	51,183	NA	NA	51,183
	TOTAL VA/NC LEASES		**NA**	**NA**	**576**	**NA**	**NA**	**576**	**NA**	**NA**	**0**	**NA**	**NA**	**0**	**NA**	**NA**	**NA**	**167,931**	**NA**	**NA**	**167931**
	OCS Total (without Proposed Action)[24, 25]:		**324**	**19**	**4,999**	**1,470**	**1,443**	**5,000**	**149**	**20**	**588**	**588**	**589**	**588**	**559,331**	**424,893**	**NA**	**3,704,836**	**1,480,731**	**1,480,731**	**3,704,836**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 8)

Region	Lease/Project/ Lease Remainder[1]	Status	Total Coolant Fluids in ESP/OSP (gallons)							Total of Oils and Lubricants in WTGs (gallons)							Total Oils and Lubricants in ESP/OSP (gallons)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total State Waters		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	46	46	46	46	NA	NA	NA	383,000	383,000	383,000	383,000	NA	NA	NA	123,559	123,559	123,559	123,559
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	27	27	NA	27	27	27	23	69,732	69,732	NA	69,732	69,732	69,732	69,732	80,045	80,045	72,076	80,045	80,045	80,045	80,045
MA/RI	Sunrise, OCS-A 0487	COP, PPA	23	23	NA	23	23	46	23	307,326	307,326	NA	307,326	307,326	307,326	307,326	199,956	199,956	NA	199,956	199,956	199,956	199,956
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	2,113	NA	NA	4,226	4,226	4,226	4,226	82,553	NA	NA	165,106	165,106	165,106	165,106	185,978	NA	NA	371,956	371,956	371,956	371,956
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	3,170	NA	NA	9,510	9,510	9,510	9,510	37,944	NA	NA	249,798	249,798	249,798	249,798	185,978	NA	NA	557,934	557,934	557,934	557,934
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	1,500	1,500	1,500	1,500	NA	NA	NA	433,650	433,650	433,650	433,650	NA	NA	NA	755,000	755,000	755,000	755,000
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA					NA	NA	NA					NA	NA	NA				
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)																					
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected).	NA	NA	NA	322	322	322	322	NA	NA	NA	1,237,090	1,237,090	1,237,090	1,237,090	NA	NA	NA	864,913	864,913	864,913	864,913
MA/RI	OCS-A 0500 remainder[c]		23	23	NA					271,930	38,300	NA					61,780	61,780	NA				
MA/RI	OCS-A 0487 remainder[c]		0	0	NA					15,320	15,320	NA					0	0	NA				

Region	Lease/Project/ Lease Remainder[1]	Status	Total Coolant Fluids in ESP/OSP (gallons)							Total of Oils and Lubricants in WTGs (gallons)							Total Oils and Lubricants in ESP/OSP (gallons)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
MA/RI	OCS-A 0520 remainder	Collectively the remaining technical capacity is 4,764 MW.	NA	NA	NA					NA	NA	NA					NA	NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	92	69	NA	368	368	368	368	635,780	302,570	NA	1,658,390	1,658,390	1,585,620	1,658,390	247,118	185,339	NA	988,472	988,472	247,118	988,472
	Total MA/RI Leases (without Proposed Actions)[2]		**5,425**	**119**	**NA**	**15,700**	**15,700**	**15,723**	**15,696**	**1,133,335**	**679,628**	**NA**	**3,267,002**	**3,267,002**	**3,194,232**	**3,267,002**	**899,075**	**465,340**	**72,076**	**3,076,922**	**3,076,922**	**2,335,568**	**3,076,922**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	NA	0	NA	NA	0	NA	NA	NA	187,964	NA	NA	187,964	NA	NA	NA	238,707	NA	NA	238,707
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	NA	0	NA	NA	0	NA	NA	NA	290,177	NA	NA	290,177	NA	NA	NA	105,669	NA	NA	105,669
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	NA	0	NA	NA	0	NA	NA	NA	420,961	NA	NA	420,961	NA	NA	NA	158,503	NA	NA	158,503
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	NA	10,300	NA	NA	10,300	NA	NA	NA	606,200	NA	NA	606,200	NA	NA	NA	370,050	NA	NA	370,050
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	212,888	NA	NA	212,888	NA	NA	NA	160,732	NA	NA	160,732
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	NA	8,240	NA	NA	8240	NA	NA	NA	475,867	NA	NA	475,867	NA	NA	NA	296,040	NA	NA	296,040
NY/NJ	Central Bight, OCS-A 0537		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	226,324	NA	NA	226,324	NA	NA	NA	287,423	NA	NA	287,423
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	172,620	NA	NA	172,620	NA	NA	NA	219,221	NA	NA	219,221
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	161,112	NA	NA	161,112	NA	NA	NA	204,606	NA	NA	204,606
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	182,210	NA	NA	182,210	NA	NA	NA	231,400	NA	NA	231,400
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	180,292	NA	NA	180,292	NA	NA	NA	228,964	NA	NA	228,964
NY/NJ	Hudson North, OCS-A 0544		NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	120,834	NA	NA	120,834	NA	NA	NA	153,455	NA	NA	153,455
	TOTAL NY/NJ LEASES		**NA**	**NA**	**NA**	**18,540**	**NA**	**NA**	**18,540**	**NA**	**NA**	**NA**	**3,237,449**	**NA**	**NA**	**3,237,449**	**NA**	**NA**	**NA**	**2,654,770**	**NA**	**NA**	**2,654,770**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	NA	46	NA	NA	46	NA	NA	NA	61,280	NA	NA	61,280	NA	NA	NA	61,780	NA	NA	61,780
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	NA	184	NA	NA	184	NA	NA	NA	478,750	NA	NA	478,750	NA	NA	NA	247,118	NA	NA	247,118
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.	NA	NA	NA	322	NA	NA	322	NA	NA	NA	344700	NA	NA	344700	NA	NA	NA	185338.5	NA	NA	185338.5
DE/MD	OCS-A 0519 remainder		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA	
	Remaining DE/MD Lease Area Total		NA	NA	NA	69	NA	NA	69	NA	NA	NA	344,700	NA	NA	344,700	NA	NA	NA	185,339	NA	NA	185338.5
	TOTAL DE/MD LEASES		**NA**	**NA**	**NA**	**621**	**NA**	**NA**	**621**	**NA**	**NA**	**NA**	**1,229,430**	**NA**	**NA**	**1,229,430**	**NA**	**NA**	**NA**	**679,575**	**NA**	**NA**	**679,575**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	NA	0	NA	NA	0	NA	NA	NA	7,660	NA	NA	7660	NA	NA	NA	0	NA	NA	0
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	NA	69	NA	NA	69	NA	NA	NA	785,150	NA	NA	785150	NA	NA	NA	185,339	NA	NA	185338.5
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	NA	23	NA	NA	23	NA	NA	NA	264,270	NA	NA	264,270	NA	NA	NA	61,780	NA	NA	61,780
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	NA	46	NA	NA	46	NA	NA	NA	463,430	NA	NA	463,430	NA	NA	NA	123,559	NA	NA	123,559
	TOTAL VA/NC LEASES		**NA**	**NA**	**NA**	**138**	**NA**	**NA**	**138**	**NA**	**NA**	**NA**	**1,520,510**	**NA**	**NA**	**1520510**	**NA**	**NA**	**NA**	**370,677**	**NA**	**NA**	**370677**
	OCS Total (without Proposed Action)[24, 25]:		**5,425**	**119**	**NA**	**34,999**	**15,700**	**15,723**	**34,995**	**1,133,335**	**679,628**	**NA**	**9,254,391**	**3,267,002**	**3,194,232**	**9,254,391**	**899,075**	**465,340**	**72,076**	**6,781,944**	**3,076,922**	**2,335,568**	**6,781,944**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 9)

Region	Lease/Project/ Lease Remainder[1]	Status	Total Diesel Fuel in WTGs (gallons)							Total Diesel Fuel in ESP/OSP (gallons)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Total State Waters		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	79,300	79,300	79,300	79,300	NA	NA	NA	5,696	5,696	5,696	5,696
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	9,516	9,516	9,516	9,516	9,516	9,516	9,516	52,834	52,834	52,834	52,834	52,834	52,834	52,834
MA/RI	Sunrise, OCS-A 0487	COP, PPA	80,886	80,886	NA	80,886	80,886	80,886	80,886	24,304	24,304	NA	24,304	24,304	24,304	24,304
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	49,135	NA	NA	98,271	98,271	98,271	98,271	5,467	NA	NA	10,935	10,935	10,935	10,935
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	22,190	NA	NA	146,087	146,087	146,087	146,087	8,201	NA	NA	24,604	24,604	24,604	24,604
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA	NA	NA	NA	132,300	132,300	132,300	132,300	NA	NA	NA	200,000	200,000	200,000	200,000
MA/RI	Beacon Wind, part of OCS-A 0520	PPA	NA	NA	NA					NA	NA	NA				
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)								NA	NA	NA	105,668	105,668	105,668	105,668
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.	NA	NA	NA	256,139	256,139	256,139	256,139	NA	NA	NA	39,872	39,872	39,872	39,872
MA/RI	OCS-A 0500 remainder[c]		56,303	7,930	NA					5,696	5,696	NA				
MA/RI	OCS-A 0487 remainder[c]		3,172	3,172	NA					0	0	NA				
MA/RI	OCS-A 0520 remainder		NA	NA	NA					NA	NA	NA				
	Remaining MA/RI Lease Area Total[2]	88%	131,638	62,647	0	343,369	343,369	328,302	343,369	11,392	8,544	NA	145,540	145,540	145,540	145,540
	Total MA/RI Leases (without Proposed Actions)[2]		**293,365**	**153,049**	**9,516**	**889,729**	**889,729**	**874,662**	**889,729**	**102,198**	**91,378**	**52,834**	**463,913**	**463,913**	**463,913**	**463,913**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA	NA	NA	NA	77,714	NA	NA	77,714	NA	NA	NA	158,502	NA	NA	158,502
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA	NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	105,673	NA	NA	105,673
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA	NA	NA	NA	n.d.	NA	NA	n.d.	NA	NA	NA	6,604	NA	NA	6,604
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA	NA	NA	NA	80,000	NA	NA	80,000	NA	NA	NA	75,000	NA	NA	75,000
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA	NA	NA	NA	88,019	NA	NA	88019	NA	NA	NA	105,673	NA	NA	105673
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)		NA	NA	NA	62,800	NA	NA	62,800	NA	NA	NA	60,000	NA	NA	60,000
NY/NJ	Central Bight, OCS-A 0537		NA	NA	NA	93,574	NA	NA	93,574	NA	NA	NA	190,849	NA	NA	190,849
NY/NJ	Hudson South B, OCS-A 0538		NA	NA	NA	71,370	NA	NA	71,370	NA	NA	NA	145,563	NA	NA	145,563
NY/NJ	Hudson South C, OCS-A 0539		NA	NA	NA	66,612	NA	NA	66,612	NA	NA	NA	135,859	NA	NA	135,859
NY/NJ	Hudson South E, OCS-A 0541		NA	NA	NA	75,335	NA	NA	75,335	NA	NA	NA	153,650	NA	NA	153,650
NY/NJ	Hudson South F, OCS-A 0542		NA	NA	NA	74,542	NA	NA	74,542	NA	NA	NA	152,033	NA	NA	152,033
NY/NJ	Hudson North, OCS-A 0544		NA	NA	NA	49,959	NA	NA	49,959	NA	NA	NA	101,894	NA	NA	101,894
	TOTAL NY/NJ LEASES		**NA**	**NA**	**NA**	**739,925**	**NA**	**NA**	**739,925**	**NA**	**NA**	**NA**	**1,391,300**	**NA**	**NA**	**1,391,300**
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA	NA	NA	NA	12,688	NA	NA	12,688	NA	NA	NA	2,848	NA	NA	2,848
DE/MD	US Wind, part of OCS-A 0490	COP, PPA	NA	NA	NA	99,125	NA	NA	99,125	NA	NA	NA	11,392	NA	NA	11,392
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The	NA	NA	NA	71370	NA	NA	71370	NA	NA	NA	8544	NA	NA	8544
DE/MD	OCS-A 0519 remainder		NA	NA	NA		NA	NA		NA	NA	NA		NA	NA	

Region	Lease/Project/ Lease Remainder[1]	Status	Total Diesel Fuel in WTGs (gallons)							Total Diesel Fuel in ESP/OSP (gallons)						
			Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice	Air	Water	Benthic/Cultural Resources	Birds/Bats/Finfish-Invertebrates-EFH/Marine Mammals/Sea Turtles/Land-Use	Navigation/ Commercial Fisheries/Other Uses	Visual/Recreation-Tourism	Demographics/ Environmental Justice
		remaining capacity may be utilized by demand from NJ or MD.														
	Remaining DE/MD Lease Area Total		NA	NA	NA	71,370	NA	NA	71370	NA	NA	NA	8,544	NA	NA	8544
	TOTAL DE/MD LEASES		**NA**	**NA**	**NA**	**254,553**	**NA**	**NA**	**254,553**	**NA**	**NA**	**NA**	**31,328**	**NA**	**NA**	**31,328**
VA/NC	CVOW, OCS-A 0497	Built	NA	NA	NA	1,586	NA	NA	1586	NA	NA	NA	0	NA	NA	0
VA/NC	CVOW-C, OCS-A 0483	COP	NA	NA	NA	162,565	NA	NA	162565	NA	NA	NA	8,544	NA	NA	8544
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP	NA	NA	NA	54,717	NA	NA	54,717	NA	NA	NA	2,848	NA	NA	2,848
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)	NA	NA	NA	95,953	NA	NA	95,953	NA	NA	NA	5,696	NA	NA	5,696
	TOTAL VA/NC LEASES		**NA**	**NA**	**NA**	**314,821**	**NA**	**NA**	**314821**	**NA**	**NA**	**NA**	**17,088**	**NA**	**NA**	**17088**
	OCS Total (without Proposed Action)[24, 25]:		**293,365**	**153,049**	**9,516**	**314,821**	**889,729**	**874,662**	**2,199,028**	**102,198**	**91,378**	**52,834**	**1,903,629**	**463,913**	**463,913**	**1,903,629**

Table E3-1. Offshore Wind Leasing Activities in the U.S. East Coast: Projects and Assumptions (as of February 1, 2022) (part 10)

Region	Lease/Project/ Lease Remainder[1]	Status	Construction Emissions NOx (tons)	Construction Emissions VOC (tons)	Construction Emissions CO (tons)	Construction Emissions PM10 (tons)	Construction Emissions PM2.5 (tons)	Construction Emissions SO2 (tons)	Construction Emissions CO2 (tons)	Operation Emissions NOx (tpy)	Operation Emissions VOC (tpy)	Operation Emissions CO (tpy)	Operation Emissions PM10 (tpy)	Operation Emissions PM2.5 (tpy)	Operation Emissions SO2 (tpy)	Operation Emissions CO2 (tpy)
			Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
NE	NE Aquaventus (state waters)	State Project	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NE	Block Island (state waters)	State Project, Built	585.96	25.73	101.16	37.15	NA	0.424	42,940.00	21.40	0.80	2.80	1.40	NA	0.01	1,572.00
	Total State Waters		**585.96**	**25.73**	**101.16**	**37.15**	**NA**	**0.424**	**42,940.00**	**21.40**	**0.80**	**2.80**	**1.40**	**NA**	**0.01**	**1,572.00**
MA/RI	Vineyard Wind 1 part of OCS-A 0501	COP, PPA, ROD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MA/RI	South Fork, OCS-A 0517	COP, PPA, ROD	1,451	59	284	49	47	33	97,026	281	6	58	10	10	2	18,894
MA/RI	Sunrise, OCS-A 0487	COP, PPA	5,876	138	2,441	108	108	6	637,986	590	14	246	11	11	1	64,145
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 1 [i.e., Park City Wind])[a]	COP, PPA	237.80	5.61	98.79	4.39	4.39	2.73	30,627.80	31.21	0.55	7.65	1.06	0.98	0.10	2,665.08
MA/RI	New England Wind, OCS-A 0534 and portion of OCS-A 0501 (Phase 2 [i.e., Commonwealth Wind])[b]	COP	1,255.64	26.73	292.36	50.36	48.73	7.45	85,811.09	76.18	1.35	18.55	2.55	2.36	0.24	7,704.73
MA/RI	Mayflower (North), part of OCS-A 0521	COP, PPA														
MA/RI	Beacon Wind, part of OCS-A 0520	PPA														
MA/RI	Bay State Wind, part of OCS-A 0500	SAP (the MW of this proposed project is included in the description below)														
MA/RI	Liberty Wind (OCS-A 0522)	This group is exposed to 4,200 MW of demand--for MA (2,400 MW remaining), CT (900 MW remaining), and RI (900 MW expected). Collectively the remaining technical capacity is 4,764 MW.														
MA/RI	OCS-A 0500 remainder[c]															
MA/RI	OCS-A 0487 remainder[c]															
MA/RI	OCS-A 0520 remainder															
	Remaining MA/RI Lease Area Total[2]	88%	16,388.00	401.00	3,686.00	569.00	547.00	127.00	1,052,650.00	234.00	7.00	60.00	8.00	8.00	1.00	18,126.00
	Total MA/RI Leases (without Proposed Actions)[2]		**17,881.44**	**433.33**	**4,077.15**	**623.76**	**600.12**	**137.18**	**1,169,088.89**	**341.39**	**8.90**	**86.20**	**11.61**	**11.35**	**1.33**	**28,495.80**
NY/NJ	Ocean Wind, part of OCS-A 0498	COP, PPA														

Region	Lease/Project/ Lease Remainder[1]	Status	Construction Emissions NOx (tons)	Construction Emissions VOC (tons)	Construction Emissions CO (tons)	Construction Emissions PM10 (tons)	Construction Emissions PM2.5 (tons)	Construction Emissions SO2 (tons)	Construction Emissions CO2 (tons)	Operation Emissions NOx (tpy)	Operation Emissions VOC (tpy)	Operation Emissions CO (tpy)	Operation Emissions PM10 (tpy)	Operation Emissions PM2.5 (tpy)	Operation Emissions SO2 (tpy)	Operation Emissions CO2 (tpy)
			Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air	Air
NY/NJ	Empire Wind 1, part of OCS-A 0512	COP, PPA														
NY/NJ	Empire Wind 2, part of OCS-A 512	PPA														
NY/NJ	Atlantic Shores OCS-A 0499	COP,PPA														
NY/NJ	Ocean Wind 2, part of OCS-A 0532	PPA														
NY/NJ	Atlantic Shores North, part of OCS-A 0499 (remainder)															
NY/NJ	Central Bight, OCS-A 0537															
NY/NJ	Hudson South B, OCS-A 0538															
NY/NJ	Hudson South C, OCS-A 0539															
NY/NJ	Hudson South E, OCS-A 0541															
NY/NJ	Hudson South F, OCS-A 0542															
NY/NJ	Hudson North, OCS-A 0544															
	TOTAL NY/NJ LEASES															
DE/MD	Skipjack, part of OCS-A 0519	COP, PPA														
DE/MD	US Wind, part of OCS-A 0490	COP, PPA														
DE/MD	GSOE I, OCS-A 0482	Collectively the technical capacity of this is group is 1,080 MW (90 turbines). The remaining capacity may be utilized by demand from NJ or MD.														
DE/MD	OCS-A 0519 remainder															
	Remaining DE/MD Lease Area Total															
	TOTAL DE/MD LEASES															
VA/NC	CVOW, OCS-A 0497	Built														
VA/NC	CVOW-C, OCS-A 0483	COP														
VA/NC	Kitty Hawk Wind, OCS-A 0508	COP														
VA/NC	Kitty Hawk Wind South, OCS-A 0508 remainder	(pre-COP)														
	TOTAL VA/NC LEASES															
	OCS Total (without Proposed Action)[24, 25]:		**17,881.44**	**433.33**	**4,077.15**	**623.76**	**600.12**	**137.18**	**1,169,088.89**	**341.39**	**8.90**	**86.20**	**11.61**	**11.35**	**1.33**	**28,495.80**

1. The spacing/layout for projects/regions are as follows: NE State water projects include a single strand of WTGs and no OSSs; for projects in the RI and MA Lease Areas, a 1 × 1–nm grid spacing is assumed; for the projects in the New Jersey/New York and the Delaware/Maryland lease areas, BOEM assumes that a 1 × 1–nm grid spacing also would be utilized; for the Coastal Virginia Offshore Wind Project, the spacing is 0.7 nm; and the Dominion commercial lease area off the coast of Virginia would utilize 0.5 nm average spacing, which is less than the 1 × 1–nm spacing due to the need to attain the state's goals.

2. Because development could occur anywhere within the RI and MA Lease Areas and assumes a continuous 1 x 1–nm grid, the actual development for these projects is expected to be approximately 88% of the collective technical capacity. Under the cumulative scenario described in in this appendix (Appendix E), the total area in the RI and MA Lease Areas is greater than the area needed to meet state demand. Therefore, if a project is not constructed, BOEM assumes that another future project would be constructed to fulfill the unmet demand.

3. This column identifies lease areas that are applicable to each resource based on the geographic analysis areas shown in the EIS.

4. The estimated construction schedules are for offshore components only. Onshore construction could begin sooner. The estimated dates are based on information as of February 1, 2022, and are subject to change when an applicant submits a COP or as project COPs progress through the approval process. Furthermore, BOEM assumes that construction of all the foundations would be installed during year 1 of a given project's construction schedule with the remaining work completed in year 2.

5. It is difficult to accurately predict future technology for planned but currently unscheduled offshore wind awards, including turbine spacing and capacity. For those projects without announced WTG sizes, BOEM used the assumption of an 8- or 12-MW WTG based on maximum-impact case for the resource. BOEM understands that it is feasible that in the future, turbine capacity could be greater than 12 MW. For future procurements and projects under this cumulative analysis, BOEM assumes a 12-MW WTG, to evaluate potential impacts.

6. The air quality geographic analysis area includes 100% of SFWF, SRWF, OCS-A 0487 remainder, and OCS-A 0486 remainder; 70% of Bay State Wind Project, 77% of OCS-A 0500 remainder; 4% of Park City Wind; and 10% of Commonwealth Wind.

7. The water quality geographic analysis area includes 100% of SFWF, OCS-A 0487 remainder, and OCS-A 0486 remainder; 90% SRWF; 46% Bay State Wind Project; and 30% of OCS-A 0500 remainder. While a small portion of Lease OCS-A 0482 overlaps with the water quality GAA spatially, the construction activities associated with this lease are not expected to overlap temporarily with activities for Revolution Wind. Given the lack of temporal overlap of construction activities, and because all other fluids and discharges associated with O&M are expected to be marginal, this lease was not factored into the water quality geographic analysis area estimates for Revolution Wind.

8. BOEM assumes that each offshore wind development would have its own cable (both onshore and offshore) and that future projects would not utilize a regional transmission line. The length of offshore export cable for those lease areas without a known project size has been assumed to include two offshore cables totaling 120 miles (193 kilometers). The offshore export cable would be buried a minimum of 6 feet (1.8 meters) but not more than 10 feet (3.1 meters).

[9.] The length of inter-array cabling has been assumed for all lease areas, except the SFWF, SRWF, and Vineyard Wind 1 which have been calculated by the applicant, to be the average amount per foundation based on the COPs submitted to date, which is 1.48 miles (2.4 kilometers). In addition, for those lease areas that require more than one OSS, it has been assumed that an additional 6.2 miles (9.9 kilometers) of inter-link cable would be required to link the two OSSs. Inter-array cable is assumed to be buried between 4 and 6 feet.

[10.] The hub height for lease areas is based on the most-impactful-case scenario for the resource area.

[11.] The rotor diameter for lease areas is based on the most-impactful-case scenario for the resource area.

[12.] The total height of the turbine for lease areas is based on the most-impactful-case scenario for the resource area.

[13.] The number of turbines for those lease areas without a known project size has been calculated based on the generating capacity and a 12-MW turbine.

[14.] The estimated number of foundations is the total number of turbines plus OSSs, and it has been assumed that for every 50 turbines there would be one OSS installed. There are some exceptions to this assumption where additional relevant information is available in publicly available COPs for future projects.

[15.] The foundation footprint has been assumed to be 0.1 acre per turbine, which is based on the largest monopile reported (12 MW) for all lease areas other than the SFWF, SRWF, New England Wind Phases 1 and 2, and Vineyard Wind 1, which have been calculated by the applicant or by using the information available in the COP for each project.

[16.] The seabed disturbance with the addition of scour protection was calculated based on scour protection expected in submitted COPs. It is assumed that for all lease areas that a 12-MW foundation with addition of scour protection would be 1.0 acre per foundation other than SFWF, SRWF, and Vineyard Wind 1, which have been calculated by the applicant or by using the information available in the COP for each project.

[17.] Offshore export cable seabed bottom disturbance is assumed to be due to installation of the export cable, the use of jack-up vessels, the need to perform dredging, and boulder removal. If information for a future project could not be obtained from a publicly available COP, export cable seabed disturbance assumed to be 1.25 acres per mile.

[18.] If information for a future project could not be obtained from a publicly available COP, the offshore export cable operating seabed footprint assumed to be 0.4 acre per mile

[19.] For projects other than the SFWF, SRWF, and New England Wind Phases 1 and 2, which have been calculated by the applicant, the offshore export cable hard protection is assumed to be similar to Vineyard Wind 1 Project, which is 0.357 acre (1.445 square meters [m^3]) per mile of offshore export cable with up to 10% of the offshore export cable requiring protection.

[20.] Anchoring disturbance for the SFWF and New England Wind Phases 1 and 2 has been calculated by the applicant. Anchoring disturbance for other lease areas has been assumed to be a rate equal to 0.10 acres (405 m^3) per mile of offshore export cable, with the exception of Vineyard Wind 1 Project, which is 0.044 acres per mile of offshore export cable.

[21.] Inter-array construction seabed disturbance for the SFWF, New England Wind Phases 1 and 2, and CVOW-C has been calculated by the applicant. Inter-array construction seabed disturbance for other lease areas has been assumed to be a rate equal to the average area per foundation, 2.4 acres (9.712 m^3) per foundation, with the exception of Vineyard Wind 1 Project, which is 2.04 acres (8.256 m^3) per foundation.

[22.] The inter-array operating footprint for the SFWF has been calculated by the applicant. The inter-array operating footprint for other lease areas is assumed to be a rate equal to the average amount per foundation of 1.43 acres (5.787 m^3) per foundation for all other lease areas.

[23.] Inter-array cable hard protection for Vineyard Wind 1, SFWF, SRWF, New England Wind Phases 1 and 2, and Mayflower have been calculated by the applicant. The inter-array cable hard protection for other lease areas is assumed to be zero.

[24.] BOEM recognizes that the estimates presented within this cumulative analysis are likely high, conservative estimates; however, BOEM believes that this analysis is appropriately capturing the potential cumulative impacts and errs on the side of maximum impacts. Totals by lease area and by OCS may not fully sum due to rounding errors.

[25]. New York's demand is not double-counted, this total comes from looking at New York's state demand, not adding up the potential of the areas because that would double-count New York.

[a.] Emissions values represent 4% of the total for Park City Wind, as only 4% of the proposed development lies within the geographic scope of direct impacts from the proposed action.

[b.] Emissions values represent 10% of the total for Common Wealth Wind, as only 10% of the proposed development lies within the geographic scope of direct impacts from the proposed action

[c.] Emissions estimated by taking the average for each pollutant per foundation for the Vineyard Wind 1 (13-MW turbine) COP and multiplying by the number of foundations in remainder/unspecified area within air quality GAA.

Literature Cited

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*. Available at: https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/IPFs-in-the-Offshore-Wind-Cumulative-Impacts-Scenario-on-the-N-OCS.pdf. Accessed December 2020.

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APPENDIX E4

Maximum-Case Scenario Estimates for Select Offshore Wind Project Components

Contents

Tables

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Introduction

The following table provides maximum-case scenario estimates of potential No Action, Proposed Action, and other action alternative impacts for specific offshore wind project components, assuming maximum buildout, using the geographic analysis areas in the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) project environmental impact statement (EIS) and cumulative estimates developed by Bureau of Ocean Energy Management BOEM (see Table E3-1 in Appendix E3). All numbers are estimates and subject to change.

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Table E4-1. Maximum-Case Scenario Estimates of Potential Impacts for Specific Offshore Wind Project Components

Project Component	Geographic Analysis Area	OCS Total (without Proposed Action)	Proposed Action	Alt C	Alt D	Alt E	Alt F	Proposed Action + OCS Total (Cumulative)	Alt C + OCS Total (Cumulative)	Alt D + OCS Total (Cumulative)	Alt E + OCS Total (Cumulative)	Alt F + OCS Total (Cumulative)
Offshore export cable length (statute miles)	**All**	4,921	84	84[Ŧ]	84[Ŧ]	84[Ŧ]	84[Ŧ]	5,005	5,005[Ŧ]	5,005[Ŧ]	5,005[Ŧ]	5,005[Ŧ]
Inter-array cable and OSS-link cable length (statute miles)	**All**	5,103	164	164[Ŧ]	164[Ŧ]	164[Ŧ]	164[Ŧ]	5,258	5,267[Ŧ]	5,267[Ŧ]	5,267[Ŧ]	5,267[Ŧ]
WTG number	**Air**	371	100	64–65	78–93	64 or 81	56	471	435–436	449–464	435 or 452	427
	Water	200	100	64–65	78–93	64 or 81	56	300	264–265	278–293	264 or 281	256
	Benthic/cultural resources	12	100	64–65	78–93	64 or 81	56	112	76–77	90–105	76 or 93	68
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	2,932	100	64–65	78–93	64 or 81	56	3,032	2,996–2,997	3,010–3,025	2,996 or 3,013	2,988
	Navigation/ commercial fisheries/other uses	1,007	100	64–65	78–93	64 or 81	56	1,107	1,071–1,072	1,085–1,100	1,071 or 1,088	1,063
	Visual/recreation-tourism	936	100	64–65	78–93	64 or 81	56	1,036	1,000–1,001	1,014–1,029	1,000 or 1,017	992
	Demographics/ environmental justice	2,932	100	64–65	78–93	64 or 81	56	3,032	2,996–2,997	3,010–3,025	2,996 or 3,013	2,988
Foundation number (WTG and OSS)	**Air**	380	102	66–67	80–95	66 or 83	58	482	446–447	460–475	446 or 463	438
	Water	205	102	66–67	80–95	66 or 83	58	307	271–272	285–300	271 or 288	263
	Benthic/cultural resources	13	102	66–67	80–95	66 or 83	58	115	79–80	93–108	79 or 96	71
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	3,008	102	66–67	80–95	66 or 83	58	3,110	3,074–3,075	3,088–3,103	3,074 or 3,091	3,066
	Navigation/ commercial fisheries/other uses	1,036	102	66–67	80–95	66 or 83	58	1,138	1,102–1,103	1,116–1,131	1,102 or 1,119	1,094
	Visual/recreation-tourism	953	102	66–67	80–95	66 or 83	58	1,055	1,019–1,020	1,033–1,048	1,019 or 1,036	1,011
	Demographics/ environmental justice	3,008	102	66–67	80–95	66 or 83	58	3,110	3,074—3,075	3,088–3,103	3,074 or 3,091	3,066
Operation footprint of foundations (WTG and OSS) (acres)	**Air**	23	3	2	2–3	2	2	26	25	25–26	25	25
	Water	12	3	2	2–3	2	2	15	14	14–15	14	14
	Benthic/cultural resources	1	3	2	2–3	2	2	4	3	3–4	3	3
	Birds/bats/finfish-invertebrates-efh/marine mammals/sea turtles/land-use	403	3	2	2–3	2	2	406	405	405–406	405	405

Project Component	Geographic Analysis Area	OCS Total (without Proposed Action)	Proposed Action	Alt C	Alt D	Alt E	Alt F	Proposed Action + OCS Total (Cumulative)	Alt C + OCS Total (Cumulative)	Alt D + OCS Total (Cumulative)	Alt E + OCS Total (Cumulative)	Alt F + OCS Total (Cumulative)
	Navigation/ commercial fisheries/other uses	199	3	2	2–3	2	2	202	201	201–202	201	201
	Visual/recreation-tourism	190	3	2	2–3	2	2	193	192	192–193	192	192
	Demographics/ environmental justice	403	3	2	2–3	2	2	406	405	405–406	405	405
Construction footprint of foundations (WTG and OSS) (acres)	**Air**	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Water	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Benthic/cultural resources	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Navigation/ commercial fisheries/other uses	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Visual/recreation-tourism	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
	Demographics/ environmental justice	Not available	734.4	475.2–482.4	576–684	475.2–597.6	417.6	Not available	Not available	Not available	Not available	Not available
Operation footprint of scour protection at foundations (foundation + scour protection) (acres)	**Air**	394	71.4	46–47	56–67	46–58	41	465.4	440–441	450–461	440 or 452	435
	Water	201	71.4	46–47	56–67	46–58	41	272.4	247–248	257–268	247 or 259	242
	Benthic/cultural resources	11	71.4	46–47	56–67	46–58	41	82.4	57–58	67–78	57 or 69	52
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	5,883	71.4	46–47	56–67	46–58	41	5,954.4	5,929–5,930	5,939–5,950	5,929 or 5,941	5,924
	Navigation/ commercial fisheries/other uses	2,753	71.4	46–47	56–67	46–58	41	2,824.4	2,799–2,800	2,809–2,820	2,799 or 2,811	2,794
	Visual/recreation-tourism	2,670	71.4	46–47	56–67	46–58	41	2,741.4	2,716–2,717	2,726–2,737	2,716 or 2,728	2,711
	Demographics/ environmental justice	5,883	71.4	46–47	56–67	46–58	41	5,954.4	5,929–5,930	5,939–5,950	5,929 or 5,941	5,924
Offshore export cable seabed disturbance (acres)	**Water**	2,126	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	3,516	3,516[Ŧ]	3,516[Ŧ]	3,516[Ŧ]	3,516[Ŧ]
	Benthic/cultural resources	555	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,945	1,945[Ŧ]	1,945[Ŧ]	1,945[Ŧ]	1,945[Ŧ]
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	10,954	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	12,344	12,344[Ŧ]	12,344[Ŧ]	12,344[Ŧ]	12,344[Ŧ]

Project Component	Geographic Analysis Area	OCS Total (without Proposed Action)	Proposed Action	Alt C	Alt D	Alt E	Alt F	Proposed Action + OCS Total (Cumulative)	Alt C + OCS Total (Cumulative)	Alt D + OCS Total (Cumulative)	Alt E + OCS Total (Cumulative)	Alt F + OCS Total (Cumulative)
	Navigation/ commercial fisheries/other uses	5,880	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	7,270	7,270[Ŧ]	7,270[Ŧ]	7,270[Ŧ]	7,270[Ŧ]
	Visual/recreation-tourism	6,023	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	7,413	7,413[Ŧ]	7,413[Ŧ]	7,413[Ŧ]	7,413[Ŧ]
	Demographics/ environmental justice	10,954	1,390	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	1,390[Ŧ]	12,344	12,344[Ŧ]	12,344[Ŧ]	12,344[Ŧ]	12,344[Ŧ]
Offshore export cable hard protection (acres)	Water	41	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	201	201[Ŧ]	201[Ŧ]	201[Ŧ]	201[Ŧ]
	Benthic/cultural resources	7	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	167	167[Ŧ]	167[Ŧ]	167[Ŧ]	167[Ŧ]
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	1,730	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	1,890	1,890[Ŧ]	1,890[Ŧ]	1,890[Ŧ]	1,890[Ŧ]
	Navigation/ commercial fisheries/other uses	892	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	1,052	1,052[Ŧ]	1,052[Ŧ]	1,052[Ŧ]	1,052[Ŧ]
	Visual/recreation-tourism	935	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	1,095	1,095[Ŧ]	1,095[Ŧ]	1,095[Ŧ]	1,095[Ŧ]
	Demographics/ environmental justice	1,730	160	160[Ŧ]	160[Ŧ]	160[Ŧ]	160[Ŧ]	1,890	1,890[Ŧ]	1,890[Ŧ]	1,890[Ŧ]	1,890[Ŧ]
Anchoring disturbance (acres)	Water	698	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	3,876	2,760–2,791	3,194–3,659	2,760 or 3,287	2,512
	Benthic/cultural resources	1,326	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	4,504	3,388–3,419	3,822–4,287	3,388 or 3,915	3,140
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	2,672	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	5,850	4,734–4,765	5,168–5,633	4,734 or 5,261	4,486
	Navigation/ commercial fisheries/other uses	2,148	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	5,326	4,210–4,241	4,644–5,109	4,210 or 4,737	3,962
	Visual/recreation-tourism	2,160	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	5,338	4,222–4,253	4,656–5,121	4,222 or 4,749	3,974
	Demographics/environmental justice	2,672	3,178	2,062–2,093	2,496–2,961	2,062 or 2,589	1,814	5,850	4,734–4,765	5,168–5,633	4,734 or 5,261	4,486
Inter-array cable and oss-link cable seabed disturbance (acres)	Water	1,008	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	3,627	3,627[Ŧ]	3,627[Ŧ]	3,627[Ŧ]	3,627[Ŧ]
	Benthic/cultural resources	340	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,959	2,959[Ŧ]	2,959[Ŧ]	2,959[Ŧ]	2,959[Ŧ]
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	10,119	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	12,738	12,738[Ŧ]	12,738[Ŧ]	12,738[Ŧ]	12,738[Ŧ]
	Navigation/ commercial fisheries/other uses	4,168	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	6,787	6,787[Ŧ]	6,787[Ŧ]	6,787[Ŧ]	6,787[Ŧ]
	Visual/recreation-tourism	4,125	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	6,744	6,744[Ŧ]	6,744[Ŧ]	6,744[Ŧ]	6,744[Ŧ]

Project Component	Geographic Analysis Area	OCS Total (without Proposed Action)	Proposed Action	Alt C	Alt D	Alt E	Alt F	Proposed Action + OCS Total (Cumulative)	Alt C + OCS Total (Cumulative)	Alt D + OCS Total (Cumulative)	Alt E + OCS Total (Cumulative)	Alt F + OCS Total (Cumulative)
	Demographics/ environmental justice	10,113	2,619	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	2,619[Ŧ]	12,732	12,732[Ŧ]	12,732[Ŧ]	12,732[Ŧ]	12,732[Ŧ]
Inter-array cable and oss-link cable hard protection (acres)	**Water**	149	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	235	235[Ŧ]	235[Ŧ]	235[Ŧ]	235[Ŧ]
	Benthic/cultural resources	29	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	115	115[Ŧ]	115[Ŧ]	115[Ŧ]	115[Ŧ]
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	588	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	674	674[Ŧ]	674[Ŧ]	674[Ŧ]	674[Ŧ]
	Navigation/commercial fisheries/other uses	588	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	674	674[Ŧ]	674[Ŧ]	674[Ŧ]	674[Ŧ]
	Visual/recreation-tourism	589	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	675	675[Ŧ]	675[Ŧ]	675[Ŧ]	675[Ŧ]
	Demographics/ environmental justice	588	85.6	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	85.6[Ŧ]	674	674[Ŧ]	674[Ŧ]	674[Ŧ]	674[Ŧ]
Total hazardous fluids (WTG and OSS) (gallons)	**Air**	2,992,729	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	4,010,535	3,739,455–3,746,985	3,844,875–3,957,825	3,739,455 or 3,867,465	3,679,215
	Water	1,814,407	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	2,832,213	2,561,133–2,568,663	2,666,553–2,779,503	2,561,133 or 2,689,143	2,500,893
	Benthic/cultural resources	134,426	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	1,152,232	881,152–888,682	986,572–1,099,522	881,152 or 1,009,162	820,912
	Birds/bats/finfish-invertebrates-EFH/marine mammals/sea turtles/land-use	18,289,598	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	19,307,404	19,036,324–19,043,854	19,141,744–19,254,694	19,036,324 or 19,164,334	18,976,084
	Navigation/ commercial fisheries/other uses	9,193,997	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	10,211,803	9,940,723–9,948,253	10,046,143–10,159,093	9,940,723 or 10,068,733	9,880,483
	Visual/recreation-tourism	8,364,829	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	9,382,635	9,111,555–9,119,085	9,216,975–9,329,925	9,111,555 or 9,239,565	9,051,315
	Demographics/ environmental justice	23,878,823	1,017,806	746,726–754,256	852,146–965,096	746,726–874,736	686,486	24,896,629	24,625,549–24,633,079	24,730,969–24,843,919	24,625,549 or 24,753,559	24,565,309

[Ŧ] Project design has not occurred for Alternatives C through F; therefore, GIS calculations for the IAC, OSS-link cable, and RWEC are not available. This table uses the Proposed Action as the most conservative proxy estimate. However, best professional judgment suggests that the footprint of the IAC, OSS-link cable, and RWEC would change and be slightly reduced to match the reduced number of WTGs under Alternatives C through F.

Literature Cited

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*. Available at: https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/IPFs-in-the-Offshore-Wind-Cumulative-Impacts-Scenario-on-the-N-OCS.pdf. Accessed December 2020.

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APPENDIX F

Environmental Protection Measures, Mitigation, and Monitoring

Contents

Tables

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Introduction

The Revolution Wind Farm (RWF) and the Revolution Wind Export Cable (RWEC) Project environmental impact statement (EIS) assesses the potential environmental, social, economic, historical, and cultural impacts that could result from the construction, operations and maintenance (O&M), and decommissioning of a wind energy project (the Project) located in the Bureau of Ocean Energy Management's (BOEM's) Renewable Energy Lease Area OCS-A 0486, approximately 15.0 miles east of Block Island, Rhode Island; approximately 12.5 miles south of the Rhode Island mainland coast; and between approximately 12.0 and 13.5 miles southeast of various points along the Massachusetts coastline in the Atlantic Ocean. The Project comprises the siting and development of the RWF and the RWEC. Revolution Wind, LLC (Revolution Wind) is proposing the Project, which is designed to contribute to Connecticut's renewable energy mandate of 2,000 megawatts (MW) of offshore wind energy by 2030 and Rhode Island's 100% renewable energy goal by 2030.

As part of the Project, Revolution Wind has committed to self-implement measures to avoid, reduce, mitigate, and/or monitor impacts on the resources discussed in Chapter 3 of the EIS. Those environmental protection measures (EPMs) are summarized in Table F-1 of this appendix. BOEM considers as part of the Proposed Action only those measures that Revolution Wind has committed to in the construction and operations plan (COP) (vhb 2022). BOEM may select alternatives and/or require additional mitigation or monitoring measures to further protect and monitor these resources. Additional mitigation and monitoring measures may result from reviews under several environmental statutes (Clean Air Act, Endangered Species Act [ESA], Magnuson-Stevens Fisheries Conservation and Management Act, Marine Mammal Protection Act [MMPA], and National Historic Preservation Act), as discussed in Appendix A of the EIS. Additional mitigation measures identified by BOEM, as well as those that may result from reviews under these statutes, are shown in Table F-2. 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 entities. Table F-2 provides descriptions of these mitigation or monitoring measures as well as those that BOEM has identified for analysis in the EIS.

If BOEM decides to approve the COP, the ROD would state which of the mitigation and monitoring measures identified by BOEM in Table F-2 have been adopted, and if not, why. Thus, the ROD would inform terms and conditions of COP approval and would compel compliance with or execution of identified mitigation and monitoring measures (40 CFR 1505.3). Revolution Wind would be required to certify compliance with certain terms and conditions, as required under 30 CFR 585.633(b). Furthermore, BOEM would periodically review the activities conducted under the approved COP. The frequency and extent of the review would be based on the significance of any changes in available information and on onshore or offshore conditions affecting, or affected by, the activities conducted under the COP. If the review indicated that the COP should be revised or amended to meet the requirement of BOEM's renewable energy regulations, Revolution Wind would be required to submit the needed revisions (30 CFR 585.634(b)).

Monitoring measures may be required to evaluate the effectiveness of a mitigation measure or to identify if resources are responding as predicted to impacts from the Proposed Action. Monitoring programs would be developed in coordination between BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to 1) modify how a mitigation measure identified in the COP or ROD is being implemented, 2) revise or develop new mitigation or monitoring measures for which compliance would be required under the RWF COP in accordance with

30 CFR 585.634(b), 3) develop measures for future projects, and/or 4) contribute to regional efforts for better understanding the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g., a potential cumulative impact assessment tool).

In this appendix, distances in miles are in statute miles (miles used in the traditional sense) or nautical miles (miles used specifically for marine navigation). Statute miles are more commonly used and are referred to simply as *miles*, whereas nautical miles are referred to by name or by their abbreviation *nm*.

Table F-1. Environmental Protection Measures Committed to by Revolution Wind, LLC

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Provided in COP Table 4.7-2					
AQ-1	Construction and installation, O&M, and decommissioning	Mitigation of air emissions	Vessels providing construction or maintenance services for the RWF will use low-sulfur fuel, where possible.	Air quality	Revolution Wind
AQ-2	Construction and installation, O&M, and decommissioning	Mitigation of air emissions	Vessel engines will meet the appropriate Environmental Protection Agency (EPA) air emission standards for nitrogen oxide (NO_X) emissions when operating within Emission Controls Areas.	Air quality	Revolution Wind
AQ-3	Construction and installation, O&M, and decommissioning	Mitigation of air emissions	Onshore Facilities equipment and fuel suppliers will provide equipment and fuels that comply with the applicable EPA or equivalent emission standards.	Air quality	Revolution Wind
AQ-4	Construction and installation, O&M, and decommissioning	Mitigation of air emissions	Marine engines with a model year of 2007 or later and non-road engines complying with the Tier 3 standards (in 40 CFR 89 or 1039) or better will be used to satisfy best available control technology (BACT) or lowest achievable emission rate (LAER).	Air quality	Revolution Wind
WQ-1	Construction and installation	Cable burial risk assessment	To the extent feasible, installation of the Inter-array cables (IACs), OSS-Link Cable, and RWEC will occur using equipment such as mechanical cutter, mechanical plow, or jet plow. The feasibility of cable burial equipment will be determined based on an assessment of seabed conditions and the Cable Burial Risk Assessment.	Water quality	Revolution Wind
WQ-2	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Water quality	Revolution Wind
WQ-3	Construction and installation, O&M, and decommissioning	Oil spill response plan (OSRP)	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP (COP Appendix D).	Water quality	Revolution Wind
WQ-4	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with United States Coast Guard (USCG) and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to Notice to Lessee (NTL) 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Water quality	Revolution Wind
WQ-5	Construction and installation	HDD contingency plan	At the landfall location, drilling fluids will be managed within a contained system to be collected for reuse as necessary. An HDD Contingency Plan will be prepared and implemented to minimize the potential risks associated with release of drilling fluids.	Water quality	Revolution Wind
WQ-6	Construction and installation, O&M, and decommissioning	Soil erosion and sediment control (SESC) plan	A SESC plan, including erosion and sedimentation control measures, will be implemented to minimize potential water quality impacts during construction and operation of the Onshore Facilities.	Water quality	Revolution Wind
Coast-1	Construction and installation	Siting of onshore facilities	Onshore Facilities will be sited within previously disturbed and developed areas to the extent practicable.	Coastal and terrestrial habitats	Revolution Wind
Coast-2	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Coastal and terrestrial habitats	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Coast-3	Construction and installation	HDD contingency plan	At the landfall location, drilling fluids will be managed within a contained system to be collected for reuse as necessary. An HDD Contingency Plan will be prepared and implemented to minimize the potential risks associated with release of drilling fluids.	Coastal and terrestrial habitats	Revolution Wind
Coast-4	Construction and installation, O&M, and decommissioning	Spill prevention and control measures and SESC plan	Compliance with the RIPDES General Permit for Stormwater Discharges associated with Construction Activity which requires the implementation of a SESC Plan and spill prevention and control measures.	Coastal and terrestrial habitats	Revolution Wind
Coast-5	Construction and installation	SESC plan	The operator must implement the site-specific SESC Plan and maintain it during the entire construction process until the entire worksite is permanently stabilized by vegetation or other means. The measures employed in the SESC Plan use best management practices (BMPs) to minimize the opportunity for turbid discharges leaving a construction work area.	Coastal and terrestrial habitats	Revolution Wind
Coast-6	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	The spill prevention and control measures mandate that the operator identify all areas where spills can occur and their accompanying drainage points. The operator must also establish spill prevention and control measures to reduce the chance of spills, stop the source of spills, contain and clean up spills, and dispose of materials contaminated by spills. Spill prevention and control training will be provided for relevant personnel.	Coastal and terrestrial habitats	Revolution Wind
Coast-7	Construction and installation and O&M	Vegetation management	The perimeter surrounding Onshore Facilities will be managed to encourage the growth of native grasses, ferns, and low-growing shrubs. The management strategy will include the removal of invasive plants in compliance with state and federal regulations (e.g., herbicide use will not be permitted within regulated wetlands).	Coastal and terrestrial habitats	Revolution Wind
Coast-8	Construction and installation	Avoidance/mitigation of wetland impacts	In accordance with Section 2.9(B)(1)(d) of the Freshwater Wetland Rules, the Onshore Facilities will be designed to avoid and minimize impacts to freshwater wetlands to the maximum extent practicable. Any wetlands that will be impacted as a result of the Project will be mitigated via the federal and state permitting process in accordance with Section 404 of the CWA and the Freshwater Wetland Rules.	Coastal and terrestrial habitats	Revolution Wind
Coast-9	Construction and installation, O&M, and decommissioning	SESC plan	An SESC Plan, including erosion and sedimentation control measures, will be implemented to minimize potential water quality impacts during construction and operation of the Onshore Facilities.	Coastal and terrestrial habitats	Revolution Wind
Coast-10	Construction and installation	Vegetation management	The documented sickle-leaved golden aster population on the OnSS parcel will be protected during construction.	Coastal and terrestrial habitats	Revolution Wind
Ben-1	Preconstruction	Siting of RWF and RWEC	The RWF and RWEC will be sited to avoid and minimize impacts to sensitive habitats (e.g., hard-bottom habitats) to the extent practicable.	Benthic habitat and invertebrates	Revolution Wind
Ben-2	Construction and installation	Cable burial risk assessment	The IAC, OSS-Link Cable, and RWEC will avoid identified shallow hazards to the extent practicable.	Benthic habitat and invertebrates	Revolution Wind
Ben-3	Construction and installation	Cable burial risk assessment	To the extent feasible, installation of the IAC, OSS-Link Cable, and RWEC will occur using equipment such as mechanical cutter, mechanical plow, or jet plow. The feasibility of cable burial equipment will be determined based on an assessment of seabed conditions and the Cable Burial Risk Assessment.	Benthic habitat and invertebrates	Revolution Wind
Ben-4	Construction and installation	Cable burial risk assessment	To the extent feasible, the RWEC, IAC, and OSS-Link Cable will typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m) below seabed. The target burial depth will be determined based on an assessment of seabed	Benthic habitat and invertebrates	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
			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.		
Ben-5	Construction and installation	Cable burial risk assessment	DP vessels will be used for installation of the IACs, OSS-Link Cable, and RWEC to the extent practicable.	Benthic habitat and invertebrates	Revolution Wind
Ben-6	Preconstruction	Anchoring plan	A plan for vessels will be developed prior to construction to identify no-anchorage areas to avoid documented sensitive resources.	Benthic habitat and invertebrates	Revolution Wind
Ben-7	Preconstruction, construction and installation, and post-construction	Fisheries and benthic monitoring studies	Revolution Wind is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and post-construction. Fisheries and benthic monitoring studies are being planned to assess the impacts associated with the Project on economically and ecologically important fisheries resources. These studies will be conducted in collaboration with the local fishing industry and will build upon monitoring efforts being conducted by affiliates of Revolution Wind at other wind farms in the region.	Benthic habitat and invertebrates	Revolution Wind
Ben-8	Preconstruction	Submerged aquatic vegetation (SAV) study	A preconstruction SAV survey will be completed to identify any new or expanded SAV beds. The Project design will be refined to avoid impacts to SAV to the greatest extent practicable.	Benthic habitat and invertebrates	Revolution Wind
Ben-9	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Benthic habitat and invertebrates	Revolution Wind
Ben-10	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials will be managed through the OSRP.	Benthic habitat and invertebrates	Revolution Wind
Ben-11	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with United States Coast Guard (USCG) and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to Notice to Lessee (NTL) 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Benthic habitat and invertebrates	Revolution Wind
Ben-12	Construction and installation	Soft start before pile driving	A ramp-up or soft start will be used at the beginning of each pile segment during impact pile driving and/or vibratory pile driving to provide additional protection to mobile species in the vicinity by allowing them to vacate the area prior to the commencement of pile-driving activities.	Benthic habitat and invertebrates	Revolution Wind
Ben-13	Construction and installation and O&M	Lighting minimization	Construction and operational lighting will be limited to the minimum necessary to ensure safety and compliance with applicable regulations.	Benthic habitat and invertebrates	Revolution Wind
Ben-14	Construction and installation	Time of year (TOY) restrictions	Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Benthic habitat and invertebrates	Revolution Wind
Ben-15	Construction, O&M	Micrositing	Avoid and minimize adverse impacts to complex benthic habitats by micrositing WTG locations into low multibeam backscatter return areas and restricting seafloor disturbance (from anchoring, jack-up legs,	Benthic habitat and invertebrates	BOEM and BSEE

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
			etc.) during construction to avoid and minimize impacts to higher multibeam backscatter return areas to the extent possible.		
Ben-16	Preconstruction and construction and installation	Siting of RWF and RWEC	The RWF and RWEC would use HRG surveys and other site characterization methods to identify, avoid, and minimize impacts to complex bottom habitats to the extent practicable	Benthic habitat and invertebrates	Revolution Wind
Ben-17	Construction and installation, O&M, and decommissioning	Fisheries and benthic monitoring plan	Revolution Wind has developed a fisheries and benthic habitat monitoring plan (dated October 2021) that has been prepared in accordance with recommendations set forth in 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).	Benthic habitat and invertebrates	Revolution Wind
Fin-1	Construction and installation	Cable burial risk assessment	To the extent feasible, installation of the IAC, OSS-Link Cable, and RWEC will occur using equipment such as mechanical cutter, mechanical plow, or jet plow. The feasibility of cable burial equipment will be determined based on an assessment of seabed conditions and the Cable Burial Risk Assessment.	Finfish and essential fish habitat	Revolution Wind
Fin-2	Construction and installation	TOY restrictions	Based on the coordination with RIDEM and NOAA NMFS to date, in general, offshore site preparation for and installation of the RWEC-RI north of the Convention on the International Regulations for Preventing Collisions at Sea ("COLREGS") line of demarcation will occur between the day after Labor Day and February 1 to avoid and minimize impacts to winter flounder (*Pseudopleuronectes americanus*) and shellfish. Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Finfish and essential fish habitat	Revolution Wind
Fin-3	Construction and installation	Cable burial risk assessment	To the extent feasible, the RWEC, IAC, and OSS-Link Cable will typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m) below seabed. The target burial depth will be determined based on an assessment of seabed conditions, seabed mobility, the risk of interaction with external hazards such as fishing gear and vessel anchors, and a site-specific Cable Burial Risk Assessment.	Finfish and essential fish habitat	Revolution Wind
Fin-4	Construction and installation	Cable burial risk assessment	DP vessels will be used for installation of the IACs, OSS-Link Cable, and RWEC to the extent practicable.	Finfish and essential fish habitat	Revolution Wind
Fin-5	Preconstruction	Anchoring plan	A plan for vessels will be developed prior to construction to identify no-anchorage areas to avoid documented sensitive resources.	Finfish and essential fish habitat	Revolution Wind
Fin-6	Preconstruction, construction and installation, and post-construction	Fisheries and benthic monitoring studies	Revolution Wind is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and post-construction. Fisheries and benthic monitoring studies are being planned to assess the impacts associated with the Project on economically and ecologically important fisheries resources. These studies will be conducted in collaboration with the local fishing industry and will build upon monitoring efforts being conducted by affiliates of Revolution Wind at other wind farms in the region.	Finfish and essential fish habitat	Revolution Wind
Fin-7	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Finfish and essential fish habitat	Revolution Wind
Fin-8	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials will be managed through the OSRP.	Finfish and essential fish habitat	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Fin-9	Construction and installation	Soft start before pile driving	A ramp-up or soft start will be used at the beginning of each pile segment during impact pile driving and/or vibratory pile driving to provide additional protection to mobile species in the vicinity by allowing them to vacate the area prior to the commencement of pile-driving activities.	Finfish and essential fish habitat	Revolution Wind
Fin-10	Construction and installation and O&M	Lighting minimization	Construction and operational lighting will be limited to the minimum necessary to ensure safety and compliance with applicable regulations.	Finfish and essential fish habitat	Revolution Wind
Fin-11	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to NTL 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Finfish and essential fish habitat	Revolution Wind
Fin-12	Construction and installation	TOY restrictions	Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Finfish and essential fish habitat	Revolution Wind
Fin-13	Construction and installation, post-construction and installation monitoring	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys would be uniquely marked to distinguish it from other commercial or recreational gear.	Finfish and essential fish habitat	Revolution Wind, BOEM, BSEE, and NMFS
MM-1	Construction and installation	Establishment of exclusion and monitoring zones for impact pile driving	Exclusion and monitoring zones for marine mammals and sea turtles will be established for impact and vibratory pile-driving activities.	Marine mammals	Revolution Wind
MM-2	Construction and installation	Impact and vibratory pile-driving mitigation measures	The following measures will be implemented for impact and vibratory pile-driving activities. These measures will include seasonal restrictions, soft-start measures, shutdown procedures, marine mammal and sea turtle monitoring protocols, the use of qualified and National Oceanic and Atmospheric Administration (NOAA)-approved Protected Species Observers, and noise attenuation systems such as bubble curtains, as appropriate.	Marine mammals	Revolution Wind
MM-3	Construction and installation, O&M, and decommissioning	Vessel speed restrictions	Vessels will follow NOAA guidelines for marine mammal and sea turtle strike avoidance measures, including vessel speed restrictions.	Marine mammals	Revolution Wind
MM-4	Construction and installation, O&M, and decommissioning	Marine mammal, sea turtle, and marine debris awareness training	All personnel working offshore will receive training on marine mammal and sea turtle awareness and marine debris awareness.	Marine mammals	Revolution Wind
MM-5	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Marine mammals	Revolution Wind
MM-6	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Marine mammals	Revolution Wind
MM-7	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to NTL 2015-G03, which instructs operators to exercise caution in the	Marine mammals	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
			handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.		
MM-8	Construction and installation	Cable burial risk assessment	To the extent feasible, the RWEC, IAC, and OSS-Link Cable will typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m) below seabed. The target burial depth will be determined based on an assessment of seabed conditions, seabed mobility, the risk of interaction with external hazards such as fishing gear and vessel anchors, and a site-specific Cable Burial Risk Assessment.	Marine mammals	Revolution Wind
MM-9	Construction and installation, post-construction and installation monitoring	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys would be uniquely marked to distinguish it from other commercial or recreational gear.	Marine mammals	Revolution Wind, BOEM, BSEE, and NMFS
MM-10	Construction and installation and post-construction and installation	MMPA application measures	Revolution Wind is committed to minimizing impacts to marine mammal species through a comprehensive monitoring and mitigation program. The mitigation measures identified in the MMPA Incidental Take Regulations application to be implemented include, but are not limited to, the following: 1. Noise attenuation through use of a noise mitigation system; 2. Seasonal restrictions; 3. Standard PSO training and equipment requirements; 4. Visual monitoring; including low visibility monitoring tools; 5. Passive acoustic monitoring; 6. Establishment and monitoring of shutdown zones 7. Pre-start clearance; 8. Ramp-up (soft-start) procedures; 9. Operations monitoring; 10. Operational shutdowns and delay; 11. Sound source measurements of at least one foundation installation 12. Survey sighting coordination; 13. Vessel strike avoidance procedures; and Data recording and reporting procedures.	Marine mammals	BOEM and BSEE
ST-1	Construction and installation	Establishment of exclusion and monitoring zones for impact pile driving	Exclusion and monitoring zones for marine mammals and sea turtles will be established for impact and vibratory pile-driving activities.	Sea turtles	Revolution Wind
ST-2	Construction and installation	Impact and vibratory pile-driving mitigation measures	The following measures will be implemented for impact and vibratory pile-driving activities. These measures will include seasonal restrictions, soft-start measures, shut-down procedures, marine mammal and sea turtle monitoring protocols, the use of qualified and NOAA-approved Protected Species Observers, and noise attenuation systems such as bubble curtains, as appropriate.	Sea turtles	Revolution Wind
ST-3	Construction and installation, O&M, and decommissioning	Vessel speed restriction	Vessels will follow NOAA guidelines for marine mammal and sea turtle strike avoidance measures, including vessel speed restrictions.	Sea turtles	Revolution Wind
ST-4	Construction and installation, O&M, and decommissioning	Marine mammal, sea turtle, and marine debris awareness training	All personnel working offshore will receive training on marine mammal and sea turtle awareness and marine debris awareness.	Sea turtles	Revolution Wind
ST-5	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Sea turtles	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
ST-6	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Sea turtles	Revolution Wind
ST-7	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to NTL 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Sea turtles	Revolution Wind
ST-8	Construction and installation	Cable burial risk assessment	To the extent feasible, the RWEC, IAC, and OSS-Link Cable will typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m) below seabed. The target burial depth will be determined based on an assessment of seabed conditions, seabed mobility, the risk of interaction with external hazards such as fishing gear and vessel anchors, and a site-specific Cable Burial Risk Assessment.	Sea turtles	Revolution Wind
ST-9	Construction and installation, post-construction and installation monitoring	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys would be uniquely marked to distinguish it from other commercial or recreational gear.	Sea turtles	Revolution Wind, BOEM, BSEE, and NMFS
Bird-1	Construction and installation	TOY restrictions for tree and shrub removal	To the extent feasible, tree and shrub removal for Onshore Facilities will occur outside the avian nesting and bat roosting period, May 1 through August 15. If tree and shrub removal cannot be avoided during this season, Revolution Wind will coordinate with appropriate agencies to determine appropriate course of action.	Birds	Revolution Wind
Bird-2	Construction and installation and O&M	WTG spacing and layout	Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with approximately 1.15-mi (1-nm) by 1.15-mi (1-nm) spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This wide spacing of WTGs will allow avian species to avoid individual WTGs and minimize risk of potential collision.	Birds	Revolution Wind
Bird-3	Construction and installation and O&M	Lighting minimization	Construction and operational lighting will be limited to the minimum necessary to ensure safety and compliance with applicable regulations.	Birds	Revolution Wind
Bird-4	Construction and installation and O&M	Lighting minimization with lighting technology	Revolution Wind will comply with Federal Aviation Administration (FAA) and USCG requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimizes impacts on avian species.	Birds	Revolution Wind
Bird-5	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Birds	Revolution Wind
Bird-6	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to NTL 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Birds	Revolution Wind
Bird-7	Construction and installation, O&M, and decommissioning	SESC plan	An SESC Plan, including erosion and sedimentation control measures, will be implemented to minimize potential water quality impacts during construction and operation of the Onshore Facilities.	Birds	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Bird-8	Construction and installation	Siting of onshore facilities	Onshore Facilities will be sited within previously disturbed and developed areas to the extent practicable.	Birds	Revolution Wind
Bird-9	Construction and installation	Burial of onshore transmission cables	The Onshore Transmission Cables will be buried; therefore, avoiding the risk to avian and bat species associated with overhead lines.	Birds	Revolution Wind
Bird-10	O&M	Adaptive mitigation for birds and bats	Revolution Wind has developed a draft Avian and Bat Post-Construction Monitoring Plan (see Appendix G and COP Appendix AA) for the Project that summarizes the approach to monitoring; describes overarching monitoring goals and objectives; identifies the key avian species, priority questions, and data gaps unique to the region and Project Area that will be addressed through monitoring; and describes methods and time frames for data collection, analysis, and reporting. Post-construction monitoring will assess impacts of the Project with the purpose of filling select information gaps and supporting validation of the Project's Avian Risk Assessment. Focus may be placed on improving knowledge of ESA-listed species occurrence and movements offshore, avian collision risk, species/species-group displacement, or similar topics. Where possible, monitoring conducted by Revolution Wind will build on and align with post-construction monitoring conducted by the other Orsted/Eversource offshore wind projects in the Northeast region. Revolution Wind will engage with federal and state agencies and environmental groups (eNGOs) to identify appropriate monitoring options and technologies and to facilitate acceptance of the final plan.	Birds	Revolution Wind, BOEM, BSEE, USFWS
Bird-11	Construction and installation, O&M, and decommissioning	Adaptive mitigation for birds and bats	Revolution Wind will document any dead (or injured) birds/bats found incidentally on vessels and structures during construction, O&M, and decommissioning and provide an annual report to BOEM and United States Fish and Wildlife Service (USFWS).	Birds	Revolution Wind
Bird-12	Construction and installation	TOY restrictions	Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Birds	Revolution Wind
Bat-1	Construction and installation and O&M	Lighting minimization	Construction and operational lighting will be limited to the minimum necessary to ensure safety and to comply with applicable regulations.	Bats	Revolution Wind
Bat-2	Construction and installation	TOY restrictions for tree and shrub removal	To the extent feasible, tree and shrub removal for Onshore Facilities will occur outside the avian nesting and bat roosting period; May 1 through August 15. If tree and shrub removal cannot be avoided during this season, Revolution Wind will coordinate with appropriate agencies to determine appropriate course of action.	Bats	Revolution Wind
Bat-3	Construction and installation and O&M	WTG spacing and layout	Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with approximately 1.15-mi (1-nm) by 1.15-mi (1-nm) spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This wide spacing of WTGs will allow avian and bat species to avoid individual WTGs and minimize risk of potential collision.	Bats	Revolution Wind
Bat-4	Construction and installation and O&M	Lighting minimization with lighting technology	Revolution Wind will comply with FAA and USCG requirements for lighting while using lighting technology (e.g., low-intensity strobe lights) that minimize impacts on avian and bat species.	Bats	Revolution Wind
Bat-5	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Bats	Revolution Wind
Bat-6	Construction and installation, O&M, and decommissioning	SESC plan	An SESC Plan, including erosion and sedimentation control measures, will be implemented to minimize potential water quality impacts during construction and operation of the Onshore Facilities.	Bats	Revolution Wind
Bat-7	Construction and installation	Siting of onshore facilities	Onshore Facilities will be sited within previously disturbed and developed areas to the extent practicable.	Bats	Revolution Wind
Bat-8	Construction and installation	Burial of onshore transmission cables	The Onshore Transmission Cables will be buried; therefore, avoiding the risk to avian and bat species associated with overhead lines.	Bats	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Bat-9	Construction and installation, O&M, and decommissioning	Adaptive mitigation for birds and bats	Revolution Wind will document any dead (or injured) birds/bats found incidentally on vessels and structures during construction, O&M, and decommissioning and provide an annual report to BOEM and USFWS.	Bats	Revolution Wind
Bat-10	Construction and installation	TOY restrictions	Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Bats	Revolution Wind
Bat-11	Construction	Minimization of long=term impacts	Comply with the Northern Long-Eared Bat 4(d) rule (81 FR 1900-1922) to avoid and minimize long-term impacts on the species and sensitive upland habitats.	Bats	BOEM and USFWS
CR-1	Construction and installation and O&M	Aircraft detection lighting system (ADLS) (or a similar system)	Revolution Wind will use Aircraft Detection Lighting System (ADLS) (or a similar system), pursuant to approval by the FAA and commercial and technical feasibility at the time of FDR/FIR approval.	Cultural resources	Revolution Wind
CR-2	Construction and installation and O&M	WTG design	RWF WTGs will have uniform design, speed, height, and rotor diameter, thereby mitigating visual clutter.	Cultural resources	Revolution Wind
CR-3	Construction and installation and O&M	WTG design	The WTGs will be painted Pure White (RAL 9010) to Light Grey (RAL 7035), as recommended by BOEM and the FAA. This color white of the turbines generally blends well with the sky at the horizon and eliminates the need for daytime warning lights or red paint marking of the blade tips.	Cultural resources	Revolution Wind
CR-4	Construction and installation	Burial of onshore transmission cables and ICF interconnection	The Onshore Transmission Cable and ICF Interconnection ROW will be buried, minimizing potential impacts to adjacent properties.	Cultural resources	Revolution Wind
CR-5	Construction and installation and O&M	Onshore facilities location	The Onshore Facilities will be located adjacent to an existing substation on a parcel zoned for commercial and industrial/utility use.	Cultural resources	Revolution Wind
CR-6	Construction and installation and O&M	Onshore facilities screening	Screening will be implemented at the aboveground Onshore Facilities to the extent feasible, to reduce potential visibility and noise.	Cultural resources	Revolution Wind
CR-7	Preconstruction	Siting of RWF and RWEC	The RWF and RWEC will be sited to avoid or minimize impacts to potential submerged cultural sites and paleolandforms, to the extent practicable.	Cultural resources	Revolution Wind
CR-8	Construction and installation and O&M	Marine survey design, execution, and interpretation	Native American Tribal representatives were involved, and will continue to be involved, in marine survey protocol design, execution of the surveys, and interpretation of the results.	Cultural resources	Revolution Wind
CR-9	Preconstruction	Anchoring plan	A plan for vessels will be developed prior to construction to identify no-anchorage areas to avoid documented sensitive resources.	Cultural resources	Revolution Wind
CR-10	Construction and installation	Unanticipated discovery plan (UDP)	An Unanticipated Discovery Plan (UDP) will be implemented that will include stop-work and notification procedures to be followed if a potentially significant archaeological resource is encountered during construction.	Cultural resources	Revolution Wind
CR-11	Construction and installation	Siting of onshore facilities	Onshore Facilities will be sited within previously disturbed and developed areas to the extent practicable.	Cultural resources	Revolution Wind
CR-12	Preconstruction	Siting of onshore facilities	Onshore Facilities will be sited to avoid or minimize impacts to potential terrestrial archeological resources, to the extent practicable.	Cultural resources	Revolution Wind
VR-1	Construction and installation	ADLS (or a similar system)	Revolution Wind will use ADLS (or a similar system), pursuant to approval by the FAA and commercial and technical feasibility at the time of FDR/FIR approval.	Visual resources	Revolution Wind
VR-2	Construction and installation and O&M	WTG design	RWF WTGs will have uniform design, speed, height, and rotor diameter, thereby mitigating visual clutter.	Visual resources	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
VR-3	Construction and installation and O&M	WTG design	The WTGs will be painted Pure White (RAL 9010) to Light Grey (RAL 7035), as recommended by BOEM and the FAA. This color white of the turbines generally blends well with the sky at the horizon and eliminates the need for daytime warning lights or red paint marking of the blade tips.	Visual resources	Revolution Wind
VR-4	Construction and installation	Burial of onshore transmission cables and ICF interconnection	The Onshore Transmission Cable and ICF Interconnection ROW will be buried, minimizing potential impacts to adjacent properties.	Visual resources	Revolution Wind
VR-5	Construction and installation and O&M	Onshore facilities screening	Screening will be implemented at the aboveground Onshore Facilities to the extent feasible, to reduce potential visibility and noise.	Visual resources	Revolution Wind
VR-6	Construction and installation and O&M	Onshore facilities design	Non-reflective paints and finishes will be used to the extent practicable on Onshore Facilities to minimize reflected glare.	Visual resources	Revolution Wind
VR-7	Construction and installation and O&M	Lighting minimization at the ONSS and ICF	Lighting at the OnSS and ICF will be kept to a minimum and turned on only as needed by manual switch.	Visual resources	Revolution Wind
Demo-1	Construction and installation, O&M, and decommissioning	Employment of local workers	Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.	Demographics, employment, and economics	Revolution Wind
Demo-2	Construction and installation	TOY restrictions of onshore facility construction	The Onshore Facilities construction schedule will be designed to minimize impacts to the local community during the summer tourist season, generally between Memorial Day and Labor Day.	Demographics, employment, and economics	Revolution Wind
Demo-3	Construction and installation and O&M	Onshore facilities screening	Screening will be implemented at the aboveground Onshore Facilities to the extent feasible, to reduce potential visibility and noise.	Demographics, employment, and economics	Revolution Wind
Demo-4	Construction and installation	Coordination with local authorities to address environmental and community concerns	Revolution Wind will coordinate with local authorities during construction of Onshore Facilities to minimize local traffic impacts; further, these Project components will be constructed in compliance with applicable regulations related to environmental and community concerns (e.g., traffic and erosion). In addition, traffic will be temporary and will not impact long-term property values.	Demographics, employment, and economics	Revolution Wind
Rec-1	Construction and installation	Fisheries communication plan	A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Project website, public notices to mariners and vessel float plans, and a fisheries liaison. Revolution Wind will submit information to the USCG to issue Local Notice to Mariners during offshore installation activities.	Recreation and tourism	Revolution Wind
Rec-2	Construction and installation	TOY restrictions on onshore facilities construction	The Onshore Facilities construction schedule will be designed to minimize impacts to the local community during the summer tourist season, generally between Memorial Day and Labor Day.	Recreation and tourism	Revolution Wind
Rec-3	Construction and installation	Coordination with local authorities to address environmental and community concerns	Revolution Wind will coordinate with local authorities during construction of Onshore Facilities to minimize local traffic impacts; further, these Project components will be constructed in compliance with applicable regulations related to environmental and community concerns (e.g., traffic and erosion). In addition, traffic will be temporary and will not impact long-term property values.	Recreation and tourism	Revolution Wind
ComFish-1	Construction and installation and O&M	WTG spacing and layout	Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with approximately 1.15-mi (1-nm) by 1.15-mi (1-nm) spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This layout has been confirmed through expert analysis to allow for safe navigation without the need for additional designated transit lanes. This layout will also provide a uniform, wide spacing among structures to facilitate search and rescue operations.	Commercial and recreational fishing	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
ComFish-2	Construction and installation	Cable burial risk assessment	To the extent feasible, installation of the Inter-Array Cable, OSS Interconnector Cable, and RWEC will occur using equipment such as mechanical cutter, mechanical plow, or jet plow. The feasibility of cable burial equipment will be determined based on an assessment of seabed conditions and the Cable Burial Risk Assessment.	Commercial and recreational fishing	Revolution Wind
ComFish-3	Construction and installation	Cable burial risk assessment	To the extent feasible, the RWEC, IAC, and OSS-Link Cable will typically target a burial depth of 4 to 6 ft (1.2 to 1.8 m) below seabed. The target burial depth will be determined based on an assessment of seabed conditions, seabed mobility, the risk of interaction with external hazards such as fishing gear and vessel anchors, and a site-specific Cable Burial Risk Assessment.	Commercial and recreational fishing	Revolution Wind
ComFish-4	Construction and installation and O&M	Implementation of BMPS	As appropriate and feasible, BMPs will be implemented to minimize impacts on fisheries, as described in the *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585* (BOEM 2020).	Commercial and recreational fishing	Revolution Wind
ComFish-5	Preconstruction, construction and installation, and post-construction	Fisheries and benthic monitoring studies	Revolution Wind is committed to collaborative science with the commercial and recreational fishing industries pre-, during, and postconstruction. Fisheries and benthic monitoring studies are being planned to assess the impacts associated with the Project on economically and ecologically important fisheries resources. These studies will be conducted in collaboration with the local fishing industry and will build upon monitoring efforts being conducted by affiliates of Revolution Wind at other wind farms in the region.	Commercial and recreational fishing	Revolution Wind
ComFish-6	Construction and installation and O&M	WTG lighting and ais installation	Each WTG will be marked and lit with both USCG and approved aviation lighting. Automatic Identification Systems (AISs) will be installed at the RWF marking the corners of the wind farm to assist in safe navigation.	Commercial and recreational fishing	Revolution Wind
ComFish-7	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Commercial and recreational fishing	Revolution Wind
ComFish-8	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Commercial and recreational fishing	Revolution Wind
ComFish-9	Construction and installation, O&M, and decommissioning	Marine debris awareness training	All vessels will comply with USCG and EPA regulations that require operators to develop waste management plans, post informational placards, manifest trash sent to shore, and use special precautions such as covering outside trash bins to prevent accidental loss of solid materials. Vessels will also comply with BOEM lease stipulations that require adherence to NTL 2015-G03, which instructs operators to exercise caution in the handling and disposal of small items and packaging materials, requires the posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly marine trash and debris awareness training and certification process.	Commercial and recreational fishing	Revolution Wind
ComFish-10	Construction and installation and O&M	Fisheries communication plan	Communications and outreach with the commercial and recreational fishing industries will be guided by the Project-specific Fisheries Communication Plan. Revolution Wind has agreed to share fisheries monitoring data with regulatory agencies and interested stakeholders upon request. Data sharing will occur on an annual cycle, which may be unique to each survey, and all data will be subject to rigorous quality assurance and quality control criterion prior to dissemination.	Commercial and recreational fishing	Revolution Wind
ComFish-11	Construction and installation, O&M, and decommissioning	Coordination with appropriate federal, state, and local contacts	Project construction, O&M, and decommissioning activities will be coordinated with appropriate contacts at USCG, Naval Undersea Warfare Center (NUWC)-Newport RI, the Northeast Marine Pilots Association, and Department of Defense (DoD) command headquarters.	Commercial and recreational fishing	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
ComFish-12	Preconstruction	Siting of RWEC	RWEC was sited to avoid conflicts with DoD use areas and navigational areas identified by the USCG, as applicable.	Commercial and recreational fishing	Revolution Wind
ComFish-13	Construction and installation	Fisheries communication plan	A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, Project website, and public notices to mariners and vessel float plans (in coordination with USCG).	Commercial and recreational fishing	Revolution Wind
ComFish-14	Construction and installation	TOY restrictions	Revolution Wind will continue to coordinate with RIDEM and NOAA NMFS regarding TOY restrictions through the permitting process and will adhere to requirements imposed by these agencies.	Commercial and recreational fishing	Revolution Wind
Nav-1	Construction and installation and O&M	WTG spacing and layout	Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with approximately 1.15-mi (1-nm) by 1.15-mi (1-nm) spacing that aligns with other proposed adjacent offshore wind projects in the RI-MA WEA. This layout has been confirmed through expert analysis to allow for safe navigation without the need for additional designated transit lanes. This layout will also provide a uniform, wide spacing among structures to facilitate search and rescue operations.	Navigation and vessel traffic	Revolution Wind
Nav-2	Construction and installation and O&M	WTG lighting and ais installation	Each WTG will be marked and lit with both USCG and approved aviation lighting. AIS will be installed at the RWF marking the corners of the wind farm to assist in safe navigation.	Navigation and vessel traffic	Revolution Wind
Nav-3	Construction and installation, O&M, and decommissioning	Spill prevention and control measures	Revolution Wind will require all construction and operations vessels to comply with regulatory requirements related to the prevention and control of spills and discharges.	Navigation and vessel traffic	Revolution Wind
Nav-4	Construction and installation, O&M, and decommissioning	OSRP	Accidental spill or release of oils or other hazardous materials offshore will be managed through the OSRP.	Navigation and vessel traffic	Revolution Wind
Nav-5	Construction and installation, O&M, and decommissioning	Coordination with appropriate federal, state, and local contacts	Project construction, O&M, and decommissioning activities will be coordinated with appropriate contacts at USCG, NUWC-Newport RI, the Northeast Marine Pilots Association, and DoD command headquarters.	Navigation and vessel traffic	Revolution Wind
Nav-6	Preconstruction	Siting of RWEC	RWEC was sited to avoid conflicts with DoD use areas and navigational areas identified by the USCG, as applicable.	Navigation and vessel traffic	Revolution Wind
Nav-7	Construction and installation	Fisheries communication plan	A comprehensive communication plan will be implemented during offshore construction to inform all mariners, including commercial and recreational fishermen, and recreational boaters of construction activities and vessel movements. Communication will be facilitated through a Fisheries Liaison, Project website, and public notices to mariners and vessel float plans (in coordination with USCG).	Navigation and vessel traffic	Revolution Wind
Nav-8	Construction and installation, O&M, and decommissioning	Consultation with appropriate federal, state, and local agencies	Revolution Wind will consult with USCG, NUWC-Newport RI, the Northeast Marine Pilots Association, and regional ferry service operators to avoid or reduce use conflicts.	Navigation and vessel traffic	Revolution Wind
Land-1	Construction and installation	Siting of onshore facilities	Onshore Facilities will be sited within previously disturbed and developed areas to the extent practicable.	Land use and coastal infrastructure	Revolution Wind
Land-2	Construction and installation	Coordination with local authorities to address environmental and community concerns	Revolution Wind will coordinate with local authorities during construction of Onshore Facilities to minimize local traffic impacts; further, these Project components will be constructed in compliance with applicable regulations related to environmental and community concerns (e.g., traffic and erosion). In addition, traffic will be temporary and will not impact long-term property values.	Land use and coastal infrastructure	Revolution Wind

EPM Number	Proposed Project Phase	EPM	Description	Resource Area Affected	BOEM's Identification of the Anticipated Enforcing Agency
Land-3	Construction and installation, O&M, and decommissioning	SESC plan	An SESC Plan, including erosion and sedimentation control measures, will be implemented to minimize potential water quality impacts during construction and operation of the Onshore Facilities.	Land use and coastal infrastructure	Revolution Wind
Other-1	Construction and installation and O&M	WTG spacing and layout	Revolution Wind is committed to an indicative layout scenario with WTGs sited in a grid with approximately 1.15-mi (1-nm) by 1.15-mi (1-nm) spacing that aligns with other proposed adjacent offshore wind projects in the RI/MA WEA. This layout has been confirmed through expert analysis to allow for safe navigation without the need for additional designated transit lanes. This layout will also provide a uniform, wide spacing among structures to facilitate search and rescue operations.	Other uses	Revolution Wind
Other-2	Construction and installation, O&M, and decommissioning	Consultation with appropriate federal, state, and local agencies	Revolution Wind will consult with USCG, NUWC-Newport RI, the Northeast Marine Pilots Association, and regional ferry service operators to avoid or reduce use conflicts.	Other uses	Revolution Wind
Other-3	Construction and installation and O&M	WTG lighting and ais installation	Each WTG will be marked and lit with both USCG and approved aviation lighting. AIS will be installed at the RWF marking the corners of the wind farm to assist in safe navigation.	Other uses	Revolution Wind
EJ-1	Construction and installation, O&M, and decommissioning	Employment of local workers	Where possible, local workers will be hired to meet labor needs for Project construction, O&M, and decommissioning.	Environmental justice	Revolution Wind
EJ-2	Construction and installation	TOY restrictions on onshore facilities construction	The Onshore Facilities construction schedule will be designed to minimize impacts to the local community during the summer tourist season, generally between Memorial Day and Labor Day.	Environmental justice	Revolution Wind
EJ-3	Construction and installation	Coordination with local authorities to address environmental and community concerns	Revolution Wind will coordinate with local authorities during construction of Onshore Facilities to minimize local traffic impacts; further, these Project components will be constructed in compliance with applicable regulations related to environmental and community concerns (e.g., traffic and erosion). In addition, traffic will be temporary and will not impact long-term property values.	Environmental justice	Revolution Wind
EJ-4	Construction and installation, O&M, and decommissioning	Studies of contaminated soil and groundwater in EJ focus areas	Investigation and remediation of contaminated soil and groundwater must be carried out in accordance with RIDEM regulations and policies regarding Environmental Justice Focus Areas including enhanced stakeholder outreach.	Environmental justice	Revolution Wind
EJ-5	Construction and installation	ADLS (or a similar system)	Revolution Wind will use ADLS (or a similar system), pursuant to approval by the FAA and commercial and technical feasibility at the time of FDR/FIR approval.	Environmental justice	Revolution Wind
EJ-6	Construction and installation	Burial of onshore transmission cables and ICF interconnection	The Onshore Transmission Cable and ICF Interconnection ROW will be buried, minimizing potential impacts to adjacent properties.	Environmental justice	Revolution Wind
EJ-7	Construction and installation and O&M	Onshore facilities screening	Screening will be implemented at the aboveground Onshore Facilities to the extent feasible, to reduce potential visibility and noise.	Environmental justice	Revolution Wind

Table F-2. Potential Additional Mitigation and Monitoring Measures

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
BOEM OCS Study 2020-039 – Radar Systems Mitigations to Operations					
1	O&M	Mitigation for ASR-8/9 radars	Operational mitigations identified for impacts on ASR-8/9: • Passive aircraft tracking using ADS-B or signal/transponder • Increasing aircraft altitude near radar • Sensitivity time control (range-dependent attenuation) • Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates) • Track initiation inhibit, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals) • Modification mitigations for ARSR-4 and for ASR-8/9 systems: • Utilizing the dual beams of the radar simultaneously • In-fill radars	Other uses – radar	BOEM and BSEE
2	O&M	Mitigation for oceanographic high frequency radars	To mitigate operational impacts on oceanographic high-frequency radars, the following options have been identified: • Data sharing from turbine operators to include the following: ○ Sharing real-time telemetry of surface currents and other oceanographic data measured at locations in the Project with radar operators into the public domain ○ Sharing time-series of blade rotation rates, nacelle bearing angles, and other information about the operational state of each of the Project's turbines with radar operators to aid interference mitigation • Wind farm curtailment/curtailment agreement Additional modifications identified for oceanographic high-frequency radar systems to mitigate impacts: • Signal processing enhancements • Antenna modifications	Other uses – radar	BOEM and BSEE
3	O&M	Mitigation for NEXRAD weather radar systems	Operational mitigations to NEXRAD weather radar systems include: • Wind farm curtailment/curtailment agreement Research is being conducted to determine whether impacts on weather radar can be mitigated by using phased array radars to achieve a null in the antenna radiation pattern in the direction of the wind turbine.	Other uses – radar	BOEM and BSEE
4	Construction, O&M, decommissioning	Add conditions of COP approval	Require the following conditions of COP approval to mitigate potential impacts on ASR-8/9: • Notify NORAD 30 to 60 days ahead of Project completion and when the Project is complete and operational for radar adverse-impact management (RAM) scheduling • Contribute funds toward execution of the RAM • Curtailment of operations for national security or defense purposes as described in the leasing agreement	Other uses – radar	BOEM and BSEE
BOEM-proposed Bird and Bat Mitigation Measures					
1	O&M	Adaptive mitigation for birds and bats	If the reported post-construction bird and bat monitoring results (generated as part of Revolution Wind's *Avian and Bat Post- Construction Monitoring Framework* [Biodiversity Research Institute 2022]) indicate bird	Birds and bats	BOEM, BSEE, and USFWS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			and bat impacts deviate substantially from the impact analysis included in this EIS, then Revolution Wind must make recommendations for new mitigation measures or monitoring methods.		
2	O&M	Bird deterrents	Install bird deterrent devices to minimize bird attraction to operating turbines and on the OSS, where appropriate and where Revolution Wind determines such devices can be safely deployed. The Lessor must concur with proposed locations. Revolution Wind must confirm location(s) of bird deterrent devices as part of the as-built documentation submitted with the facility installation report.	Birds	USFWS
3	Construction	TOY restrictions	Conduct marine construction activities during approved in-water work windows developed in consultation with the Services.	Birds and bats	BOEM and USFWS
BOEM-proposed Commercial Fisheries and For-Hire Recreational Fishing Mitigation Measures					
1	Construction, O&M	Compensation for Gear Loss and Damage	The Lessee shall implement a gear loss and damage compensation program consistent with BOEM's draft guidance for Mitigating Impacts to Commercial and recreational fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 or as modified in response to public comment.	Commercial and recreational fisheries	BOEM and BSEE
2	Construction, O&M	Compensation for Lost Fishing Income	The Lessee shall implement a compensation program for lost income for commercial and recreational fishermen and other eligible fishing interests for construction and operations 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.	Commercial and recreational fisheries	BOEM and BSEE
3	O&M	Mobile gear friendly cable protection measures	Cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure chiefly ensures that seafloor cable protection does not introduce new hangs for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered/sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the Lessee should consider using materials that mirror the benthic environment.	Commercial and recreational fisheries	BOEM and BSEE
DOD-proposed Measures					
1	O&M	Fiber-optic sensing technology	Distributed fiber-optic sensing (DFOS) technology proposed for the wind energy project or associated transmission cables would be reviewed by the DOD to ensure that DFOS is not used to detect sensitive data from DOD activities, conduct any other type of surveillance of U.S. Government operations, or to otherwise pose a threat to national security.	Other uses – military and national security	BOEM, BSEE, and DOD
NHPA Mitigation Measures					
1	Construction and installation	Avoid or minimize and mitigate impacts on identified NRHP-eligible cultural resources	Mitigation measures for cultural resources are drafted in the memorandum of agreement (MOA) and its historic property treatment plans attached in Appendix K. Revolution Wind committed measures identified in COP Appendix BB – Cultural resources Avoidance, Minimization, and Mitigation Measures would also be incorporated by BOEM into COP approval. This MOA and its requirements would be set by BOEM under NHPA Section 106 as a condition of BOEM's signing the ROD. Under the MOA, adverse effects from the Project to NRHP-eligible cultural resources, including NHLs and TCPs, would be avoided, minimized, or mitigated in accordance with the NHPA Section 106 regulations (36 CFR 800) and in compliance with Section 110(f).	Cultural resources	BOEM, BSEE, USACE
BOEM-proposed Mitigation and Monitoring Measures in the BA submitted to NMFS					
1	Construction and installation, O&M, and decommissioning	Marine debris awareness training	The Lessee would ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the approved COP complete marine trash and debris awareness training annually. The training	Finfish, marine mammals, sea turtles	BOEM and BSEE

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			consists of two parts: (1) viewing a marine trash and debris training video or slide show (described below); and (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at https://www.bsee.gov/debris or by contacting BSEE. The training videos, slides, and related material may be downloaded directly from the website. Operators engaged in marine survey activities would continue to develop and use a marine trash and debris awareness training and certification process that reasonably assures that their employees and contractors are in fact trained. The training process would include the following elements: • Viewing of either a video or slide show by the personnel specified above; • An explanation from management personnel that emphasizes their commitment to the requirements; • Attendance measures (initial and annual); and • Recordkeeping and the availability of records for inspection by DOI. By January 31 of each year, the Lessee would submit to DOI an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. The Lessee would send the reports via email to BOEM (at renewable_reporting@boem.gov) and to BSEE (at marinedebris@bsee.gov).		
2	Construction and installation and post- construction and installation	Marine debris elimination	Marking: Materials, equipment, tools, containers, and other items used in OCS activities which are of such shape or properly secured to prevent loss overboard. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed.	Birds, Finfish, marine mammals, sea turtles	BOEM and BSEE
3	Construction and installation and post- construction and installation	Incorporate LOA requirements	The measures required by the final MMPA Letter of Authorization (LOA) for Incidental Take Regulations would be incorporated into COP approval, and BOEM and/or BSEE will monitor compliance with these measures.	Marine mammals	BOEM and BSEE
4	Construction, O&M, and decommissioning	Passive acoustic monitoring (PAM)	Use PAM buoys or autonomous PAM devices to record ambient noise, marine mammals, and cod vocalizations in the Lease Area before, during, and immediately after construction (at least 3 years of operation) to monitor Project noise. The archival recorders must have a minimum capability of detecting and storing acoustic data on anthropogenic noise sources (such as vessel noise, pile driving, WTG operation, and whale detections), marine mammals, and cod vocalizations in the Lease Area. Monitoring would also occur during the decommissioning phase. The total number of PAM stations and array configuration will depend on the size of the zone to be monitored, the amount of noise expected in the area, and the characteristics of the signals being monitored to accomplish both monitoring during constructions, and also meet post-construction monitoring needs. Results must be provided within 90 days of construction completion and again within 90 days of the 1-year, 2-year, and 3-year anniversary of collection. The underwater acoustic monitoring must follow standardized measurement and processing methods and visualization metrics developed by the Atlantic Deepwater Ecosystem Observatory Network (ADEON) for the U.S. Mid- and South Atlantic OCS (see https://adeon.unh.edu/). At least two buoys must be independently deployed within or bordering the Lease Area or one or more buoys must be deployed in coordination with other acoustic monitoring efforts in the RI and MA Lease Areas.	Finfish, marine mammals, sea turtles	BOEM, BSEE, and NMFS
5	Construction and installation, post-construction and installation monitoring	PAM plan	BOEM, BSEE, and USACE would ensure that Revolution 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 would 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. EFH conservation recommendations for PAM would be incorporated into the plan, and BOEM and/or BSEE will monitor compliance with these measures.	Finfish, marine mammals, sea turtles	BOEM, BSEE, and NMFS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
6	Construction and installation	Pile driving monitoring plan	BOEM would ensure that Revolution Wind prepare and submit a *Pile Driving Monitoring Plan* to NMFS and BSEE (at OSWsubmittals@bsee.gov) for review and concurrence at least 90 days before start of pile driving.	Marine mammals, Sea turtles	BOEM, BSEE, and NMFS
7	Construction and installation	PSO coverage	BOEM, BSEE, and USACE would ensure that PSO coverage is sufficient to reliably detect marine mammals and sea turtles at the surface in clearance and shutdown zones to execute any pile driving delays or shutdown requirements. 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.	Marine mammals, Sea turtles	BOEM, BSEE, and USACE
8	Construction and installation	Sound field verification	BOEM, BSEE, and USACE would 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 would 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. To validate the estimated sound field, sound field verification measurements will be conducted during pile driving of the first three monopiles installed over the course of the Project, with noise attenuation activated. A Sound Field Verification Plan will be submitted to NMFS, BOEM, and BSEE for review and approval at least 90 days prior to planned start of pile driving. This plan will describe how Revolution Wind will ensure that the first three monopile installation sites selected for sound field are representative of the rest of the monopile installation sites and, in the case that they are not, how additional sites will be selected for sound field verification. This plan will also include methodology for collecting, analyzing, and preparing SFV data for submission to NMFS. The plan will describe how the effectiveness of the sound attenuation methodology will be evaluated based on the results. In the event that Revolution Wind obtains technical information that indicates a subsequent monopile is likely to produce larger sound fields, SFV will be conducted for those subsequent monopiles.	Marine mammals, Sea turtles, Finfish, Benthic Habitat, EFH, Invertebrates	BOEM, BSEE, and NMFS
9	Construction and installation	Shutdown zones and clearance zone adjustment	BOEM, BSEE, and NMFS may consider adjustments in the pre-start clearance and/or shutdown zones based on the initial sound field verification (SFV) measurements. Revolution Wind will provide the initial results of the SFV measurements to NMFS in an interim report after each monopile installation for the first three piles as soon as they are available but no later than 48 hours after each installation. Revolution Wind will conduct a SFV to empirically determine the distances to the isopleths corresponding to Level A harassment and Level B harassment thresholds, including at the locations corresponding to the modeled distances to the Level A harassment and Level B harassment thresholds. If initial SFV measurements indicate distances to the isopleths are less than the distances predicted by modeling assuming 10 dB attenuation, Revolution Wind may request a modification of the clearance and shutdown zones for impact pile driving. For a modification request to be considered by NMFS, Revolution Wind must have conducted SFV on at least three piles to verify that zone sizes are consistently smaller than predicted by modeling. If initial SFV measurements indicate distances to the isopleths are greater than the distances predicted by modeling, Revolution Wind will implement additional sound attenuation measures prior to conducting additional pile driving. Additional measures may include improving the efficacy of the implemented noise attenuation technology and/or modifying the piling schedule to reduce the sound source. If modeled zones cannot be achieved by these corrective actions, Revolution Wind will install an additional noise mitigation system to achieve the modelled ranges. Each sequential modification will be evaluated empirically by SFV. Additionally, in the event that SFV measurements continue to indicate distances to isopleths corresponding to Level A harassment and Level B harassment thresholds are consistently greater than the distances predicted by modeling, NMFS may expand the relevant clearance and shutdown zones and associated monitoring measures.	Marine mammals, Sea turtles	BOEM, BSEE, and NMFS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
10	Construction and installation	Monitoring zone for sea turtles	BOEM, BSEE, and USACE would ensure that Revolution Wind monitors the full extent of the area where noise would exceed the 175 dB re 1 μPa^2 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.	Sea turtles	BOEM, BSEE, and USACE
11	Construction and installation, O&M, and conceptual decommissioning	Reporting of all NARW sightings	If a NARW is observed at any time by PSOs or personnel on any Project vessels, during any Project-related activity or during vessel transit, Revolution Wind must report the sighting information to NMFS as soon as feasible and no later than within 24 hours after conclusion of the detection event (the time, location, and number of animals) via the WhaleAlert app (http://www.whalealert.org/); NMFS Right Whale Sighting Advisory System hotline (phone); and PR.ITP.MonitoringReports@noaa.gov.	Marine mammals	BOEM and NMFS
12	Construction and installation, O&M, and decommissioning	Vessel strike avoidance measures for sea turtles	Between June 1 and November 30, Revolution Wind would have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout would communicate any sightings, in real time, to the captain so that the requirements in (e) below can be implemented. a. The trained lookout would monitor https://seaturtlesightings.org/ prior to each trip and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators/captains and lookouts on duty that day. b. 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. Alternative monitoring technology (e.g., night vision, thermal cameras, etc.) would be available to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member, this would be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts would receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. c. 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. d. 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. e. All vessel crew members would be briefed in the identification of ESA-listed species of sea turtles and in regulations and best practices for avoiding vessel collisions. Reference materials would be available aboard all Project vessels for identification of sea turtles. The expectation and process for reporting of sea turtles (including live, entangled, and dead individuals) would be clearly communicated and posted in highly visible locations aboard all Project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. f. 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. g. 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, giant manta rays, and sea turtles.	Sea turtles	BOEM, BSEE, and USACE

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
13	Construction and installation, post-construction and installation monitoring	Sampling gear	All sampling gear would be hauled out at least once every 30 days, and all gear would be removed from the water and stored on land between survey seasons to minimize risk of entanglement.	Finfish, marine mammals, sea turtles	BOEM and BSEE
14	Construction and installation, post-construction and installation monitoring	Lost survey gear	If any survey gear is lost, all reasonable efforts that do not compromise human safety would be undertaken to recover the gear. All lost gear would be reported to NMFS (nmfs.gar.incidental-take@noaa.gov) and BSEE (OSWIncidentReporting@bsee.gov) within 24 hours of the documented time of missing or lost gear. This report would include information on any markings on the gear and any efforts undertaken or planned to recover the gear.	Finfish, marine mammals, sea turtles	BOEM, BSEE, and NMFS
15	Construction and installation, post-construction and installation monitoring	Training	At least one of the survey staff onboard the trawl surveys and ventless trap surveys would have completed NEFOP observer training (within the last 5 years) or other training in protected species identification and safe handling (inclusive of taking genetic samples from Atlantic sturgeon). Reference materials for identification, disentanglement, safe handling, and genetic sampling procedures would be available on board each survey vessel. BOEM and BSEE would ensure that Revolution Wind prepares a training plan that addresses how this requirement would be met and that the plan is submitted to NMFS in advance of any trawl or trap surveys. This requirement is in place for any trips where gear is set or hauled.	Finfish	BOEM, BSEE, and NMFS
16	Construction and installation, post-construction and installation monitoring	Sea turtle disentanglement	Vessels deploying fixed gear (e.g., pots/traps) would have adequate disentanglement equipment (i.e., knife and boathook) onboard. Any disentanglement would occur consistent with the Northeast Atlantic Coast STDN Disentanglement Guidelines at https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501 and the procedures described in "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (NOAA Technical Memorandum 580; https://repository.library.noaa.gov/view/noaa/3773).	Sea turtles	BOEM, BSEE, and NMFS
17	Construction and installation, post-construction and installation monitoring	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. a. The Sturgeon and Sea Turtle Take Standard Operating Procedures would be followed (https://media.fisheries.noaa.gov/dammigration/sturgeon_&_sea_turtle_take_sops_external.pdf). b. Survey vessels would have a passive integrated transponder (PIT) tag reader onboard capable of reading 134.2 kHz and 125 kHz encrypted tags (e.g., Biomark GPR Plus Handheld PIT Tag Reader) and this reader be used to scan any captured sea turtles and sturgeon for tags. Any recorded tags would be recorded on the take reporting form (see below). c. Genetic samples would be taken from all captured Atlantic sturgeon (alive or dead) to allow for identification of the DPS of origin of captured individuals and tracking of the amount of incidental take. This would be done in accordance with the Procedures for Obtaining Sturgeon Fin Clips (https://media.fisheries.noaa.gov/dammigration/ sturgeon_genetics_sampling_revised_june_2019.pdf). i. Fin clips would be sent to a NMFS approved laboratory capable of performing genetic analysis and assignment to DPS of origin. To the extent authorized by law, BOEM is responsible for the cost of the genetic analysis. Arrangements would be made for shipping and analysis in advance of submission of any samples; these arrangements would be confirmed in writing to NMFS within 60 days of the receipt of this ITS. Results of genetic analysis, including assigned DPS of origin would be submitted to NMFS within 6 months of the sample collection. ii. Subsamples of all fin clips and accompanying metadata forms would be held and submitted to a tissue repository (e.g., the Atlantic Coast Sturgeon Tissue Research Repository) on a	Finfish, Sea turtles	BOEM, BSEE, and NMFS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			quarterly basis. The Sturgeon Genetic Sample Submission Form is available for download at: https://www.fisheries.noaa.gov/new-england- midatlantic/consultations/section-7-take-reporting-programmaticsgreater-atlantic). d. All captured sea turtles and Atlantic sturgeon would be documented with required measurements and photographs. The animal's condition and any marks or injuries would be described. This information would be entered as part of the record for each incidental take. A NMFS Take Report Form would be filled out for each individual sturgeon and sea turtle (download at: https://media.fisheries.noaa.gov/2021-41507/Take%20Report%20Form%20 07162021.pdf?null) and submitted to NMFS as described below.		
18	Construction and installation, post-construction and installation monitoring	Sea turtle/Atlantic sturgeon handling and resuscitation guidelines	Any sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys would be handled and resuscitated (if unresponsive) according to established protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s) to do so. Specifically: a. Priority would be given to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used, if conditions at sea are safe to do so. Handling times for these species should be minimized (i.e., kept to 15 minutes or less) to limit the amount of stress placed on the animals. b. All survey vessels would have copies of the sea turtle handling and resuscitation requirements found at 50 CFR 223.206(d)(1) prior to the commencement of any on-water activity (download at: https://media.fisheries.noaa.gov/ dammigration/sea_turtle_handling_and_resuscitation_measures.pdf). These handling and resuscitation procedures would be carried out any time a sea turtle is incidentally captured and brought onboard the vessel during the proposed actions. c. If any sea turtles that appear injured, sick, or distressed, are caught and retrieved in fisheries survey gear, survey staff would immediately contact the Greater Atlantic Region Marine Animal Hotline at 866-755-6622 for further instructions and guidance on handling the animal, and potential coordination of transfer to a rehabilitation facility. If unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), the USCG should be contacted via VHF marine radio on Channel 16. If required, hard-shelled sea turtles (i.e., non- leatherbacks) may be held on board for up to 24 hours following handling instructions provided by the Hotline, prior to transfer to a rehabilitation facility. d. Attempts would be made to resuscitate any Atlantic sturgeon that are unresponsive or comatose by providing a running source of water over the gills as described in the Sturgeon Resuscitation Guidelines (https://media.fisheries.noaa.gov/dammigration-miss/Resuscitation-Cards-120513.pdf). e. Provided that appropriate cold storage facilities are available on the survey vessel, following the report of a dead sea turtle or sturgeon to NMFS, and if NMFS requests, any dead sea turtle or Atlantic sturgeon would be retained on board the survey vessel for transfer to an appropriately permitted partner or facility on shore as safe to do so. f. Any live sea turtles or Atlantic sturgeon caught and retrieved in gear used in any fisheries survey would ultimately be released according to established protocols and whenever at-sea conditions are safe for those releasing the animal(s) to do so.	Finfish, Sea turtles	BOEM, BSEE, and NMFS
19	Construction and installation, post-construction and installation monitoring	Take notification	GARFO PRD would be notified as soon as possible of all observed takes of sea turtles, and Atlantic sturgeon occurring as a result of any fisheries survey. Specifically: a. GARFO PRD would be notified within 24 hours of any interaction with a sea turtle or sturgeon (nmfs.gar.incidental- take@noaa.gov and BSEE at protectedspecies@bsee.gov). The report would include at a minimum: (1) survey name and applicable information (e.g., vessel name, station number); (2) GPS coordinates describing the location of the interaction (in decimal degrees); (3)	Finfish, Sea turtles	BOEM, BSEE, and NMFS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			gear type involved (e.g., bottom trawl, gillnet, longline); (4) soak time, gear configuration and any other pertinent gear information; (5) time and date of the interaction; and (6) identification of the animal to the species level. Additionally, the e-mail would transmit a copy of the NMFS Take Report Form (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%20 07162021.pdf?null) and a link to or acknowledgement that a clear photograph or video of the animal was taken (multiple photographs are suggested, including at least one photograph of the head scutes). If reporting within 24 hours is not possible due to distance from shore or lack of ability to communicate via phone, fax, or email, reports would be submitted as soon as possible; late reports would be submitted with an explanation for the delay. b. At the end of each survey season, a report would be sent to NMFS that compiles all information on any observations and interactions with ESA-listed species. This report would also contain information on all survey activities that took place during the season including location of gear set, duration of soak/trawl, and total effort. The report on survey activities would be comprehensive of all activities, regardless of whether ESA-listed species were observed.		
20	Construction and installation, O&M, and decommissioning	Monthly/ annual reporting requirements	BOEM and BSEE would ensure that Revolution 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 Revolution Wind, NMFS, BOEM and BSEE. All reports would be sent to: nmfs.gar.incidental- take@noaa.gov and BSEE at OSWsubmittals@bsee.gov.	Finfish, marine mammals, sea turtles	BOEM, BSEE, and NMFS
21	Construction and installation, O&M, and decommissioning	Vessel strike avoidance plan measures	BOEM will require Revolution Wind to comply with measures and reporting outlined in the final Vessel Strike Avoidance Plan per the MMPA ITR LOA.	Marine mammals	BOEM, BSEE, and NMFS
BOEM-proposed Measures from the Data Collection and Site Survey Activities for Renewable Energy on the Atlantic OCS BA					
1	Construction and installation, O&M, and decommissioning	Data collection BA 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 Revolution Wind Project as applicable.	Finfish, marine mammals, sea turtles	BOEM and BSEE
NMFS-proposed Measures to Minimize Impacts on Benthic Habitat					
1	Construction and installation	Scour and cable protection	BOEM should require scour and cable protection within complex habitats of the Lease Area to use natural, rounded stone of consistent grain size to match existing conditions. Scour and cable protection placed within soft-sediment habitats should incorporate natural, rounded cobble and boulders that does not inhibit epibenthic growth and provides three- dimensional complexity, both in height and in interstitial spaces, as technically and economically feasible. Concrete mattresses should not be permitted to be used as scour protection within hard bottom and structurally complex habitats, and any required use of concrete mattresses for cable protection should be mitigated through the addition of natural, rounded stone. Should the use of any engineered stone be necessary, it should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes. BOEM should require that the applicant provide descriptions and specifications for any proposed engineered stone for agency comment and review prior to final design selection.	Benthic habitat	BOEM and BSEE
Other Agency-proposed Mitigation Measures					

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
4	Construction and installation	Recreational fishing	BOEM and BSEE would ensure that Revolution Wind develops a construction schedule that minimizes overlap with recreational fishing tournaments and other important seasonal recreational fishing events.	Recreation and tourism	BOEM and BSEE
5	Construction, O&M	Vessel speed restriction	All vessels, regardless of size, would comply with a 10-knot speed restriction in any Seasonal Management Area (SMA), Dynamic Management Area (DMA), or Slow Zone.	Marine mammals, Sea turtles	BOEM and BSEE
6	Construction and installation	Safety zone during cable installation	BOEM and BSEE would ensure that Revolution Wind coordinates with the U.S. Coast Guard in advance of export cable installation to develop a navigation safety plan, which may include: establishing a safety zone around the cable laying vessel(s); monitoring plan; mitigation plan; schedule; private aids to navigation; and, local notice to mariners.	Navigation and vessel traffic	BOEM and BSEE
7	O&M	Post-installation cable monitoring	Revolution Wind must provide BOEM with a cable monitoring report within 45 calendar days following each inter-array and export cable inspection to determine cable location, burial depths, state of the cable, and site conditions. An inspection of the inter-array cable and export cable is expected to include HRG methods, such as a multi-beam bathymetric survey equipment, and identify seabed features, natural and man-made hazards, and site conditions along federal sections of the cable routing. In federal waters, the initial inter-array and export cable inspection would be carried out within 6 months of commissioning and subsequent inspections would be carried out at years 1, 2, and every 3 thereafter and after a major storm event. Major storm events are defined as when metocean conditions at the facility meet or exceed the 1 in 50-year return period calculated in the metocean design basis, to be submitted to BOEM with the Facility Design Report (FDR). If conditions warrant adjustment to the frequency of inspections following the Year 2 survey, a revised monitoring plan may be provided to BOEM for review. In addition to inspection, the export cable would be monitored continuously with the as-built Distributed Temperature Sensing System. If Distributed Temperature Sensing data indicate that burial conditions have deteriorated or changed significantly and remedial actions are warranted, the Distributed Temperature Sensing data, a seabed stability analysis, and report of remedial actions taken or scheduled must be provided to BOEM within 45 calendar days of the observations. The Distributed Temperature Sensing data, cable monitoring survey data, and cable conditions analysis for each year must be provided to BOEM as part of the Annual Compliance Reports, required by 30 CFR § 585.633(b).	Benthic habitat, EFH, invertebrates, finfish, and commercial fisheries and for-hire recreational fishing	BOEM and BSEE
8	Construction, O&M, decommissioning	Submarine cable system burial plan	A copy of the submarine cable system burial plan shall be submitted by Revolution Wind as part of their Facility Design Report and Fabrication and Installation Report that depicts precise planned locations and burial depths of the entire cable system.	Navigation and vessel traffic	BOEM and BSEE
9	Construction	Boulder relocation reporting	The locations of any boulder (which would protrude >2 m or more on the sea floor) relocated during cable installation activities must be reported to BOEM, USCG, NOAA, and the local harbormaster.	Navigation and vessel traffic	BOEM and BSEE
10	Construction, O&M, decommissioning	Vessel safety practices	All Project vessels involved in construction, operations, maintenance, and decommissioning activities would comply with U.S. or international Safety of Life as Sea (SOLAS) standards, as applicable, with regards to vessel construction, vessel safety equipment, and crewing practices.	Navigation and vessel traffic	BOEM and BSEE
11	Construction, O&M, decommissioning	WTG shut-down mechanism	Equip all WTG rotors (blade assemblies) with control mechanisms to enable remote shut down of requested WTGs by the USCG. A formal shut-down procedure would be part of the standard operating procedures and periodically tested. Normally, USCG-ordered shut downs would be limited to those WTGs in the immediate vicinity of an emergency and for as short a period as is safely practicable under the circumstances, as determined by the USCG.	Other uses – military and national security	BOEM and BSEE
12	Construction, O&M, decommissioning	Adherence to federal survey mitigation guidance	BOEM is committed to working with NOAA Fisheries toward a long-term regional solution to account for changes in survey methodologies because of offshore wind farms. NOAA Fisheries and BOEM recently published (March 22, 2022) a draft Federal Survey Mitigation Implementation Strategy for the Northeast U.S. Region to address anticipated impacts of offshore wind energy development on NOAA Fisheries' scientific	Other uses – scientific research and surveys	BOEM, BSEE, and NMFS

Mitigation Number	Proposed Project Phase	Mitigation or Monitoring Measure	Description	Resource Area Mitigated	BOEM's Identification of the Anticipated Enforcing Agency[3]
			surveys. Activities described in the implementation strategy are designed to mitigate the effect of offshore wind energy development on NOAA Fisheries surveys and is referred to as the Federal Survey Mitigation Program. The mitigation program will include survey-specific mitigation plans for each affected survey including both vessel and aerial surveys. The implementation strategy is intended to guide the implementation of the mitigation program through the duration of wind energy development in the Northeast U.S. region and Revolution Wind will adhere to the measures suggested to the extent practicable. The measures from the published implementation strategy will be analyzed in the Final EIS.		
13	Construction, O&M	Environmental data sharing with federally recognized tribes	No later than ninety (90) days after COP approval, Revolution Wind must, at a minimum, contact the federally recognized tribes currently participating in government-to-government consultations with BOEM for the Project in order to solicit their interest in receiving access to the results of reports generated as a result of the Fisheries Research Monitoring Plan; reporting of all NARW sightings; injured or dead protected species reporting (turtles and NARW); NARW PAM monitoring; PSO reports (e.g., weekly pile driving reports); pile-driving schedule and changes thereto. At a minimum, Revolution Wind should offer access to the following federally recognized tribes: the Mashpee Wampanoag Tribe, the Wampanoag of Gay Head (Aquinnah); the Mashantucket Pequot Indian Tribe; the Narraganset Indian Tribe; and the Delaware Tribe of Indians. Revolution Wind must provide access to non-proprietary/non-confidential business information to the federally recognized tribes no later than 30 days after the information becomes available.	Environmental justice	BOEM
14	Construction and installation, O&M, conceptual decommissioning	Anchoring plan	Given the extent of complex habitats in the Project areas, BOEM should require the applicant to develop an anchoring plan to ensure anchoring is avoided and minimized in complex habitats during construction and maintenance of the Project. This plan should specifically delineate areas of complex habitat around each turbine and cable locations, and identify areas restricted from anchoring. Anchor chains should include mid-line buoys to minimize impacts to benthic habitats from anchor sweep where feasible. The habitat maps and inshore maps delineating eelgrass habitat adjacent to the O&M facility should be provided to all cable construction and support vessels to ensure no anchoring of vessels be done within or immediately adjacent to these complex habitats. The anchoring plan should be provided for our review and comment prior to BOEM approval.	Benthic habitat, EFH, invertebrates, and finfish	BOEM and BSEE

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Literature Cited

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*. Available at: https://www.boem.gov/newsroom/boem-renewable-benthic-habitat-guidelines. Accessed August 1, 2021.

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APPENDIX G

Environmental and Physical Settings and Supplemental Information

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Figures

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Introduction

This appendix provides information on the environmental and physical settings of the Lease Area and information by resource or topic, as applicable, that supplements the information provided in the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) Project environmental impact statement (EIS).

Environmental and Physical Settings

This section addresses the physical, geological, and biological settings in the vicinity of the RWF and RWEC Project (the Project). As directed under Section 1501.12 of the Council on Environmental Quality's (CEQ's) revised National Environmental Policy Act (NEPA) regulations, this EIS incorporates, by reference, the detailed analysis provided in the Vineyard Wind final EIS in Appendix E (Bureau of Ocean Energy Management [BOEM] 2021).

For more specific environmental and physical setting information, the reader is referred to the following COP sections in the *Construction and Operations Plan Revolution Wind Farm* (COP) (vhb 2022):

- General regional setting: See Sections 4.6.7 and 4.3.1 of the COP. These sections describe current land uses and land cover types in the vicinity of the onshore Project components.
- Climate: See Section 4.2.1 of the COP. This section describes current air quality in the vicinity of the RWF and RWEC.
- Physical oceanography and meteorology: See Section 4.2.4 of the COP. This section provides detailed information on physical oceanographic conditions, including circulation, currents, and water column stratification by temperature and salinity, as well as meteorological conditions such as wind speed and direction, occurrence of storms and cyclones, and ice and fog. Few hurricanes pass through New England, but the area is subjected to frequent Nor'easters that form offshore between Georgia and New Jersey and typically reach maximum intensity in New England. These storms are usually characterized by winds from the northeast and can bring heavy precipitation, wind, storm surges, and rough seas. They primarily occur between September and April but can form any time of year. Although hurricanes are relatively infrequent in New England, wave heights up to 30 feet (9 meters [m]) were recorded south of Block Island (Scripps Buoy 44097) during Hurricane Sandy in 2012 (National Oceanic and Atmospheric Administration, National Weather Service 2012).
- Geological resources: See Section 4.2.3 of the COP. This section describes the regional geological setting as well as specific marine geophysical and geotechnical site investigations conducted for the RWF in accordance with BOEM regulations 30 CFR 585.
- Biological resources: See Sections 4.3.2 to 4.3.7 of the COP. These sections describe current types and status of terrestrial and marine resources in the vicinity of the RWF and RWEC.

Analysis of potential impacts to these resources from all offshore wind activities is provided in the EIS as part of each resource's No Action Alternative discussion. Discussion of impacts as a result of the Proposed Action references the No Action Alternative where possible to reduce replication and focus the analysis to the differences among alternatives. EPMs and any other measures that would be implemented to monitor or minimize resource impacts are discussed in Appendix F.

Literature Cited

Bureau of Ocean Energy Management. 2021. *Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement*. OCS EIS/EA BOEM 2021-0012. Available at: https://www.boem.gov/vineyard-wind. Accessed June 2021.

National Oceanic and Atmospheric Association National Weather Service. 2012. *New England Effects from the Hurricane Sandy Hybrid Storm*. Available at: https://www.weather.gov /media/box/science/Sandy_summary_BOX.pdf. Accessed February 28, 2022.

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Avian and Bat Post-Construction Monitoring Framework

Revolution Wind, LLC (Revolution Wind) has developed a draft avian and bat post-construction monitoring plan for the Project that summarizes the approach to monitoring; describes overarching monitoring goals and objectives; identifies the key avian species, priority questions, and data gaps unique to the region and Lease Area that would be addressed through monitoring; and describes methods and time frames for data collection, analysis, and reporting (see COP Appendix AA [Biodiversity Research Institute 2021]). Post-construction monitoring would assess impacts of the Project with the purpose of filling select information gaps and supporting validation of the Project's avian risk assessment. Focus may be placed on improving knowledge of Endangered Species Act (ESA)–listed species occurrence and movements offshore, avian collision risk, species/species group displacement, or similar topics. Where possible, monitoring conducted by Revolution Wind would build on and align with post-construction monitoring conducted by the other Orsted/Eversource offshore wind projects in the Northeast region. Revolution Wind would engage with federal and state agencies and environmental groups to identify appropriate monitoring options and technologies and to facilitate acceptance of the final avian and bat post-construction monitoring plan (see COP Appendix AA [Biodiversity Research Institute 2021]).

The content of the draft *Revolution Wind Avian and Bat Post-Construction Monitoring Framework* is provided below and is a direct excerpt from the *Assessment of the Potential Effects of the Revolution Offshore Wind Farm on Birds and Bats* (COP Appendix AA [Biodiversity Research Institute 2021:232–236]). Full references supporting this excerpt's author-year citations can be found in COP Appendix AA.

Introduction

Revolution Wind LLC (Revolution Wind), a 50/50 joint venture between Orsted North America Inc. (Orsted NA) and Eversource Investment LLC (Eversource), proposes to construct and operate the RWF and the RWEC, collectively the Revolution Wind Farm Project (hereinafter referred to as the Project). The wind farm portion of the Project will be in Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0486 (Lease Area), southeast of Point Judith, Rhode Island, and east of Block Island, Rhode Island. The Project's generating capacity will range between 704 megawatts (MW) and 880 MW. This RWF Avian and Bat Post-Construction Monitoring Framework (hereafter the “Framework”) focuses solely on the offshore footprint of the Project within the Lease Area, and does not apply to the offshore export cable, cable landfall, or onshore portions of the Project.

Revolution Wind has developed this Framework to outline an approach to post-construction monitoring that supports advancement of the understanding of bird and bat interactions with offshore wind farms. The scope of monitoring is designed to meet federal requirements [30 CFR 585.626(b)(15) and 585.633(b)] and is scaled to the size and risk profile of the Project with a focus on species of conservation concern.

The intent of the Framework is to outline overarching monitoring objectives, monitoring questions, proposed monitoring elements, and reporting requirements. A detailed Avian and Bat Post-Construction Monitoring Plan (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, U.S. Fish and Wildlife Service (USFWS), and other relevant regulatory agencies prior to beginning monitoring. Where feasible, monitoring conducted at the RWF will be coordinated with monitoring at neighboring Orsted/Eversource offshore wind projects—South Fork Wind Farm (SFWF) and Sunrise Wind Farm (SRWF)—to facilitate integrated analyses across a broader geographic area.

Monitoring objectives, questions, and associated methods are summarized in Table G-AB1. Technical approaches were selected based on offshore logistical constraints, their ability to address monitoring objectives, and their effectiveness in the marine environment. Emerging technologies, such as multi-sensor radar/camera collision detection systems, are not proposed under this Framework because they have not yet been broadly deployed offshore or demonstrated to effectively reduce uncertainties related to potential impacts on birds and bats.

Table G-AB1. Monitoring Objectives, Questions, General Approaches to be Used, and Duration

Taxa	Monitoring Objective	Primary Questions	Approach	Duration
Bats	Monitor occurrence of bats	What times of year and under what environmental conditions are bats detected in the wind farm?	Acoustics	2 years
Birds	Monitor use by ESA listed birds	What times of year and under what conditions are ESA birds present in the wind farm?	Radio tags	up to 3 years
Birds	Monitor use by nocturnal migratory birds	What are the flux rates and flight heights of nocturnally migrating birds?	Radar	1-2 years
Birds	Monitor movement of marine birds around the turbines	What are the avoidance rates of marine birds?	Radar	1-2 years

Both	Document mortality	What dead or injured species are found incidentally?	Incidental observations	Project lifetime

Bat Acoustic Monitoring

The presence of bats in the marine environment has been documented in the U.S. (Hatch et al. 2013, Solick and Newman 2021). However, there remains uncertainty regarding the extent to which bats occur offshore, particularly within offshore wind farms. Acoustic detectors are commonly used to study bat movements and migration (Johnson et al. 2011). Following the approach taken at SFWF (Final Environmental Impact Statement Appendix F[1]), Orsted/Eversource would conduct bat acoustic monitoring to assess bat activity at RWF, targeting key data gaps related to species presence/composition, temporal patterns of activity, and correlation with weather and atmospheric conditions. The primary monitoring questions are: What times of year and under what environmental conditions are bats detected in the wind farm?

Acoustic monitoring of bat presence would be conducted for two years post-construction. A detector would first be tested onsite to determine if there is any sound interference. Contingent on a successful test, ultrasonic bat detector stations would be installed on the offshore convertor station, wind turbine platforms, and/or buoys. The specific number and location of detector stations would be selected to optimize study design goals, and would be determined in cooperation with BOEM, USFWS, and other relevant regulatory agencies. While specific timing would be dictated by logistics, detectors would likely be deployed in the early spring or late winter (March), and removed in the late fall or early winter (December) after migration, or the most appropriate period as determined in cooperation with BOEM, USFWS, and other relevant regulatory agencies. The detectors would record calls of both cave-hibernating bats, including the northern long-eared bat (Myotis septentrionalis), and migratory tree bats; the resulting information can be used to identify bats to species. All acoustic data recorded would be processed with approved software to filter out poor quality data and identify the presence of bat calls. Where information is insufficient to make a species identification, calls would be classified to one of two phonic groups: low frequency bats (LoF), or high frequency bats (HiF). The HiF group includes both migratory tree bats and cave hibernating bats. Since HiFi include the ESA-listed northern long-eared bat, they would then be manually vetted by an experienced acoustician to the highest resolution possible (e.g., species or genus).

All bat calls detected and identified would be analyzed to understand relationships with time of day, season, and weather/atmospheric conditions. The results would provide information on bat presence offshore and the conditions under which they may occur near offshore wind turbines.

[1] https://www.boem.gov/renewable-energy/state-activities/south-fork

Motus Tracking Network and ESA Use Study

Tracking studies indicate that at least some individual ESA-listed Piping Plovers (*Charadrius melodus*), Red Knots (*Calidris canutus rufa*), and Roseate Terns, may pass through the Rhode Island and Massachusetts lease areas (Loring et al. 2018, 2019). However, due to limited coverage of onshore automated telemetry receiving stations and low probability of detecting tags (hereafter, Motus receivers and tags) in the offshore environment (Loring et al. 2019), there remains uncertainty related to offshore movements of ESA-listed birds in New England. Revolution Wind would install offshore Motus receiver stations and contribute funding to radio-tagging efforts to address this data gap. The exact species being studied would be determined in consultation with federal agencies and would be dependent on existing, ongoing field efforts. The Motus receivers would also provide opportunistic presence/absence data on other species carrying Motus tags, such as migratory songbirds and bats. The primary monitoring questions are: What times of year and under what environmental conditions are ESA birds present in the wind farm?

Movements of radio-tagged ESA-listed birds in the vicinity of the RWF would be monitored for up to three years post-construction, during the spring, summer, and fall. Motus receivers would be installed within the wind farm to determine the presence/absence of ESA-listed species. The specific number and location of offshore receiver stations would be selected to optimize study design goals, and would be determined using a design tool currently being developed through a New York State Energy Research and Development Authority (NYSERDA) funded project[2]. If there is a need identified by USFWS and in coordination with efforts at SFWF and RWF, existing Motus receiver stations at up to two onshore locations near the RWF would be refurbished or maintained to confirm the presence and movements of radio-tagged ESA-species in areas adjacent to RWF. Funding for up to 150 Motus tags per year would be provided to researchers working with ESA-listed birds for up to three consecutive years.

ESA-listed bird presence/absence in the wind farm would be analyzed by comparing detections within the wind farm to coastal receiver towers. All detections would be analyzed to understand relationships with time of day, season, and weather.

Radar Monitoring: Nocturnal Migrants Flux and Flight Heights

Nocturnal migrants, including songbirds and shorebirds, are documented to fly offshore (Adams et al. 2015, Loring et al. 2020). Since nocturnal migration events are episodic and cannot be detected during daytime surveys, there is uncertainty on the timing and intensity of migration offshore. Radar, oriented vertically, has been used at offshore wind farms in Europe to study nocturnal migration events (Hill et al. 2014). Orsted/Eversource is considering conducting a one-to-two-year radar study across SRWF, SFWF, and RWF

[2] https://www.briloon.org/renewable/automatedvhfguidance

to record the passage rates (flux) of migrants and flight heights. The primary monitoring questions are: What are the flux rates and flight heights of nocturnally migrating birds?

Since radar approaches to monitoring birds are actively evolving and feasibility would need to be determined, a specific system and methods would be identified closer to when the projects begin operating. The results would be related to time of year and weather conditions, to increase the understanding on when nocturnal migrants may have higher collision risk.

Radar Monitoring: Marine Bird Avoidance

Marine birds, particularly loons, sea ducks, auks, and the Northern Gannet (Morus bassanus), have been documented to avoid offshore wind farms, potentially leading to displacement from habitat (Goodale and Milman 2016). However, there remains uncertainty on how birds would respond to Orsted/Eversource's large turbines that would be spaced one nautical mile apart. Based on methods used by Desholm and Kahlert (2005), Skov et al. (2018), and others, Orsted/Eversource is considering conducting a one-to-two-year cross-project (SRWF, SFWF, and RWF) radar study to collect data on macro (and potentially meso—i.e., flying between turbines) avoidance rates. These data on avoidance would support understanding of both displacement and collision vulnerability. The primary monitoring questions is: What are the avoidance rates of marine birds?

Documentation of Dead and Injured Birds and Bats

Revolution Wind, or its designated operator, would implement a reporting system to document dead or injured birds or bats found incidentally on vessels and project structures during construction, operation, and decommissioning. The location would be marked using GPS, an Incident Reporting Form would be filled out, and digital photographs taken. Any animals detected that could be ESA-listed, would have their identity confirmed by consulting biologists, and a report would be submitted to the designated staff at Revolution Wind who would then report it to BOEM, USFWS, and other relevant regulatory agencies. Carcasses with federal or research bands or tags would be reported to the U.S. Geological Survey (USGS) Bird Band Laboratory, BOEM, and USFWS.

Adaptive Monitoring

Adaptive monitoring is an important principle underlying Revolution Wind's post-construction monitoring Framework. Over the course of monitoring, Revolution Wind would work with BOEM, USFWS, and other relevant regulatory agencies, to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring, based on an ongoing assessment of monitoring results. Potential triggers for adaptive monitoring may include, but not be limited to, equipment failure, an unexpected impact to birds or bats identified through monitoring, or new opportunities to collaborate with other projects in the region. The Monitoring Plan would include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies, to be considered as appropriate.

Reporting

Revolution Wind would submit an annual report to BOEM and USFWS summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. Revolution Wind would participate in an annual meeting with BOEM and USFWS to discuss the report. (Biodiversity Research Institute 2021:232–236)

Literature Cited

Biodiversity Research Institute (bri). 2021. *Assessment of the Potential Effects of the Revolution Wind Offshore Wind Farm on Birds and Bats*. *Lease Area OCS-A-0486*. Appendix AA in *Construction and Operations Plan Revolution Wind Farm*. Portland, Maine: bri. April.

Commercial Fisheries and For-Hire Recreational Fishing

Information in this section provides an overview of the commercial fisheries data used in EIS Section 3.9. It also provides a description of the methodological approach used to describe the dependency of fishermen on the Lease Area.

Overview of Commercial Fisheries Data Used in the Environmental Impact Statement Section 3.9

The primary source of data was summarized vessel trip report (VTR) data provided by the National Marine Fisheries Service (NMFS) (2021a). Included were annual VTR data (2008–2019) for specific geographic areas relevant to the Project showing commercial fishing revenue, trips, and number of unique vessels for each fishery management plan (FMP) fishery, species, gear, and port of landing.[3] These data were also used to analyze the distribution of commercial fishing revenue from the Lease Area across fishing vessels. In addition, the VTR data provided by NMFS (2021a) described the activities of for-hire recreational fishing vessels, including landings by species and the number of angler trips by port.

A second source of data was the website at NMFS (2021b), which summarizes commercial fisheries data for each proposed WEA along the U.S. Atlantic Coast. These data were downloaded and used to summarize revenue at risk across all proposed offshore wind projects under the No Action Alternative.

[3] NMFS requires all federally permitted commercial fishing vessels (with the exception of those vessels that only have a lobster permit) to submit a VTR for every fishing trip (50 CFR 648.7). The VTR data provide a broad census of fishing activity that encompasses the majority of commercial fisheries active near the RWF and offshore RWEC. VTRs include a single fishing location (reported in latitude and longitude coordinates) for each trip. VTR location information is only an approximation of fishing activity, particularly with respect to the use of mobile gear, because fishermen self-report only one set of coordinates for a fishing trip, despite the fact that one trip may include multiple gear tows that take place in many different locations across a much wider area. VTR instructions require that fishermen record the haulback position where most of the fishing occurred (Livermore 2017; NMFS 2020a).

A fisherman with a vessel with a federal lobster permit is only required to fill out a VTR if he or she has another federal permit. Approximately 63% of the lobster fleet fishing in statistical area 537, which encompasses most of the RI/MA WEAs, reports through VTRs (Atlantic States Marine Fisheries Commission 2018).

In addition, polar histograms (Figure 3.9-3 through Figure 3.9-5) developed by BOEM based on NMFS vessel monitoring system (VMS) data provided by NMFS (2019) are included in Section 3.9. [4] From January 2014 through August 2019, VMS coverage levels ranged between 90% and 100% for the following FMP fisheries: Atlantic Herring; Bluefish; Mackerel, Squid, and Butterfish; Monkfish; Northeast Multispecies (large-mesh); Northeast Multispecies (small-mesh); Sea Scallop; Spiny Dogfish; Summer Flounder, Scup, and Black Sea Bass; and Surfclam and Ocean Quahog. Average VMS coverage levels were lower for the following FMP fisheries: Skate (75%); Highly Migratory Species (48%); Jonah Crab (14%); and American Lobster (11%) (NMFS 2019).

Average Annual Revenues and Non-Disclosure Issues

In general, Section 3.9 provides information on the average annual revenue over the 2008–2019 period. However annual data were provided only for the years for which data could be disclosed. If an annual data-point for a given FMP, gear, or port within a given geographic area could not be disclosed because there were an insufficient number of vessels or dealers, then NMFS added the datapoint to a "non-disclosed" category. By combining all the datapoints that could not be disclosed, NMFS was able to report to the annual total revenue for every year. However, this methodology for reporting non-disclosed data points hampers accurate estimation of average annual revenue because there were often non-disclosed data for one or more years, particularly if the geographic area is small or if there were relatively low levels of participation. Table G-1 is provided to demonstrate these issues. The table shows the annual data for gears as provided by NMFS for the RWEC from 2008 to 2019. It is not possible to infer whether numbers shown as zero (with a "–") denote zero revenue for the gear or that the data were not disclosed and assigned to the "All Other Gear" category.

Table G-1. National Marine Fisheries Service-Greater Atlantic Regional Fisheries Office Commercial Fishing Annual Revenue Data for the Lease Area

Gear	2008 ($1000s)	2009 ($1000s)	2010 ($1000s)	2011 ($1000s)	2012 ($1000s)	2013 ($1000s)	2014 ($1000s)	2015 ($1000s)	2016 ($1000s)	2017 ($1000s)	2018 ($1000s)	2019 ($1000s)	Non-Zero Years
Dredge-Scallop	$10.8	$5.6	$2.8	$14.4	–	$5.3	$8.3	$17.8	$20.6	$6.1	$4.8	$11.0	11
Gillnet-Sink	$35.3	$38.7	$49.3	$38.3	$24.3	$22.9	$24.7	$20.8	$25.8	$25.8	$15.5	$15.9	12
Handline	$1.4	$1.1	$0.8	$0.8	$0.7	$0.5	$1.3	$0.5	$1.1	$1.7	$1.4	$1.4	12
Pot-Lobster	$139.3	$105.5	$91.8	$70.1	$79.0	$50.8	$52.8	$55.6	$55.3	$49.8	$65.1	$89.3	12
Pot-Other	$2.0	$3.2	$17.5	$21.2	$12.9	$10.5	$5.1	$6.5	$11.0	$9.5	$20.1	$15.0	12
Trawl-Bottom	$115.5	$114.2	$139.7	$185.9	$263.6	$237.5	$191.6	$205.3	$187.3	$150.4	$155.1	$182.8	12

[4] VMS data are generated from automated transmissions from transponders that are required to be on board and operating whenever permitted vessels are fishing or transiting with the intent to harvest fish or shellfish. Data are transmitted once every 60 minutes for all FMPs except sea scallops, which are transmitted once every 30 minutes. Each transmission includes the current directional bearing and vessel speed as well as the average bearing and vessel speed since the last transmission. Using the average vessel speed, NMFS uses an algorithm to assign an assumed activity (either fishing or transiting) to each transmission.

Gear	2008 ($1000s)	2009 ($1000s)	2010 ($1000s)	2011 ($1000s)	2012 ($1000s)	2013 ($1000s)	2014 ($1000s)	2015 ($1000s)	2016 ($1000s)	2017 ($1000s)	2018 ($1000s)	2019 ($1000s)	Non-Zero Years
Trawl-Midwater	$8.3	$43.9	$7.9	$37.9	$131.8	$100.3	$125.6	$51.6	$36.9	$0.7	–	–	10
Dredge-Scallop	$10.8	$5.6	$2.8	$14.4	–	$5.3	$8.3	$17.8	$20.6	$6.1	$4.8	$11.0	11
Dredge-Clam	–	$7.8	–	–	–	$0.9	–	–	–	–	–	–	2
Longline-Bottom	–	–	–	–	–	$0.1	$0.1	–	–	–	–	–	2
All other gear*	$17.8	$10.6	$13.0	$12.0	$7.3	$0.1	$3.8	$27.6	$16.3	$6.5	$3.2	$19.6	12
All gear types	$341.3	$336.3	$325.5	$395.0	$519.7	$434.1	$421.7	$403.5	$374.7	$256.5	$270.0	$345.8	$0.1

Source: NMFS (2022).

Notes: Revenue is adjusted for inflation to thousands of 2019 dollars. ND = not disclosed. A "–" indicates a value equal to zero, while $0.0 indicates a value greater than zero, but less than $500.

Commercial Fisheries Revenue Intensity Figures

The revenue intensity figures for commercial fisheries shown in Figures G-1 through G-13 have been developed to provide a visual representation of harvesting locations across FMP fisheries. These figures are reproduced from the Fishing Footprints webpage (NMFS 2020b) with the addition of the Lease Area and the RWEC superimposed. The figures provided are generally limited to those that are available for the years 2016 through 2018, although an exception is made for Figure G-13, which summarizes the revenue intensity of all fisheries combined and which is provided for the years 2013 through 2015 (the most recent data available on the webpage).

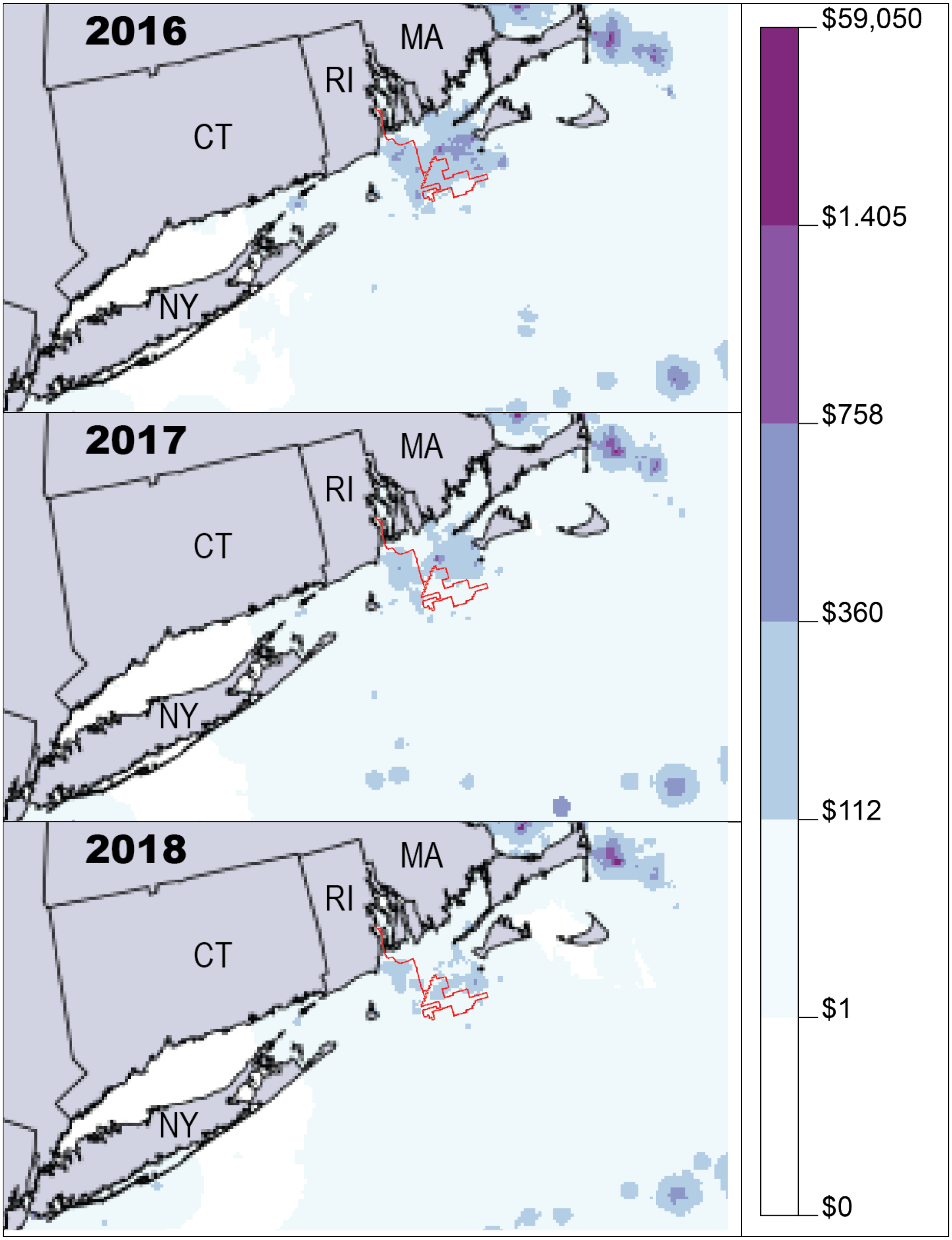

Figure G-1. Revenue Intensity for the American Lobster Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

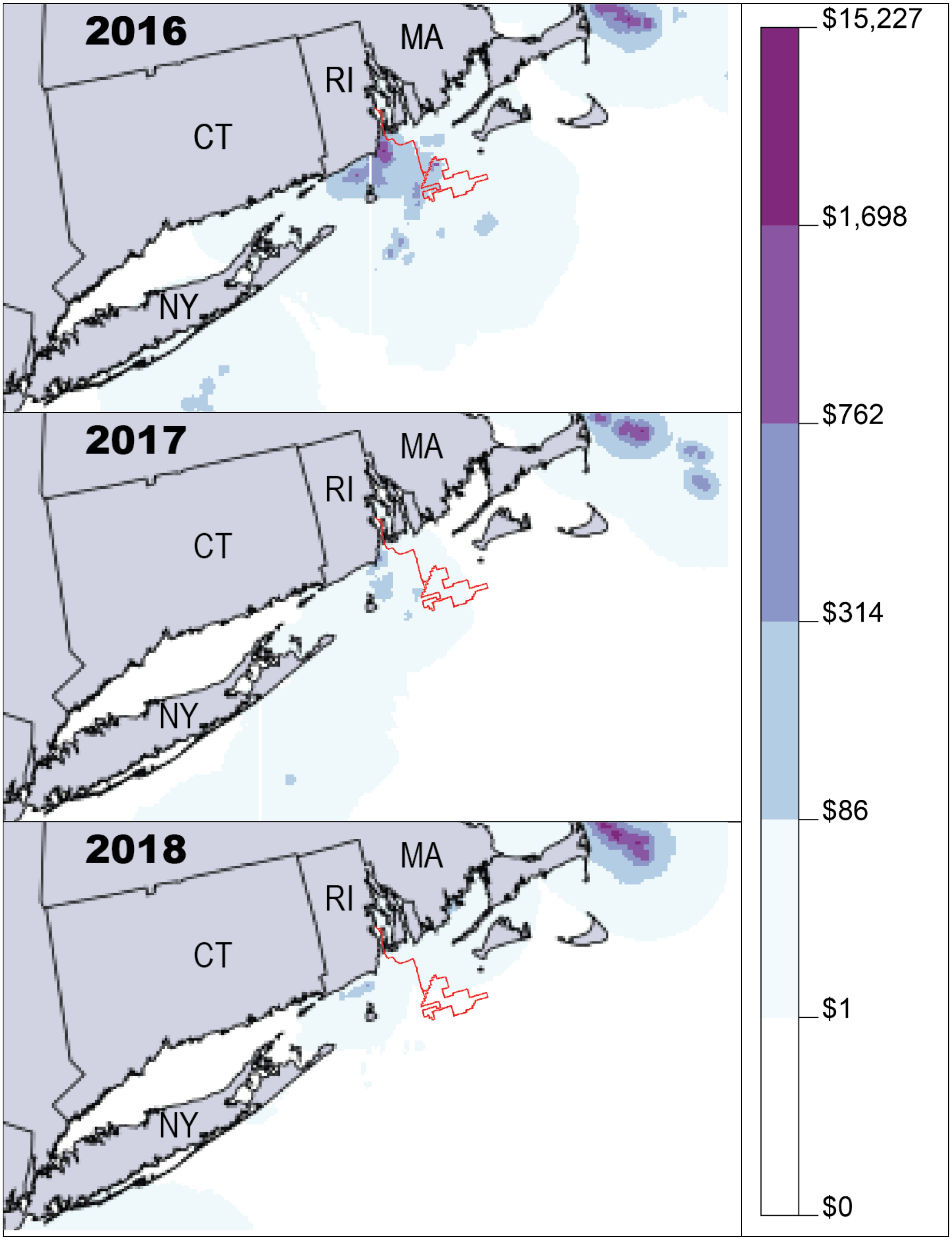

Figure G-2. Revenue Intensity for the Atlantic Herring Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

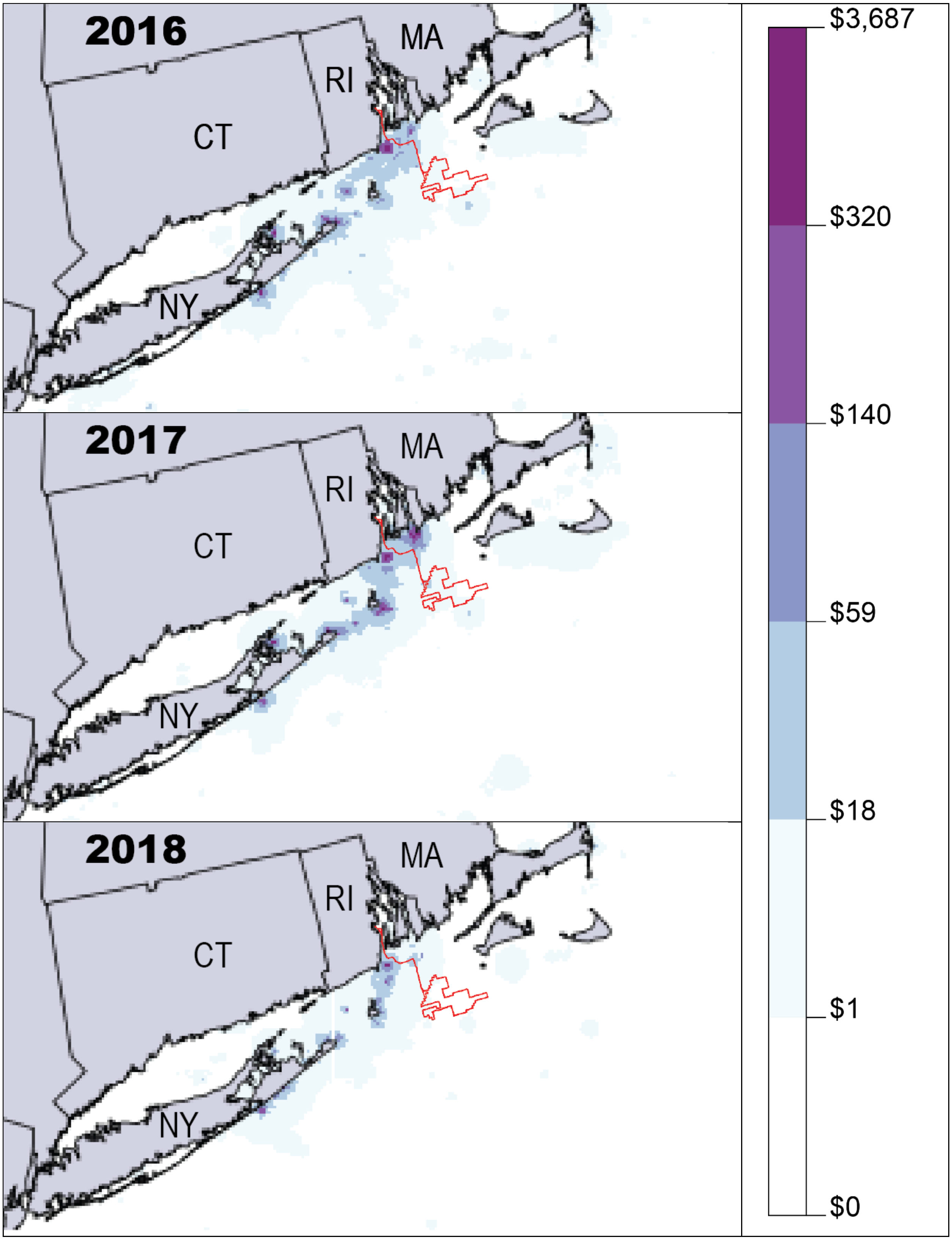

Figure G-3. Revenue Intensity for the Bluefish Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

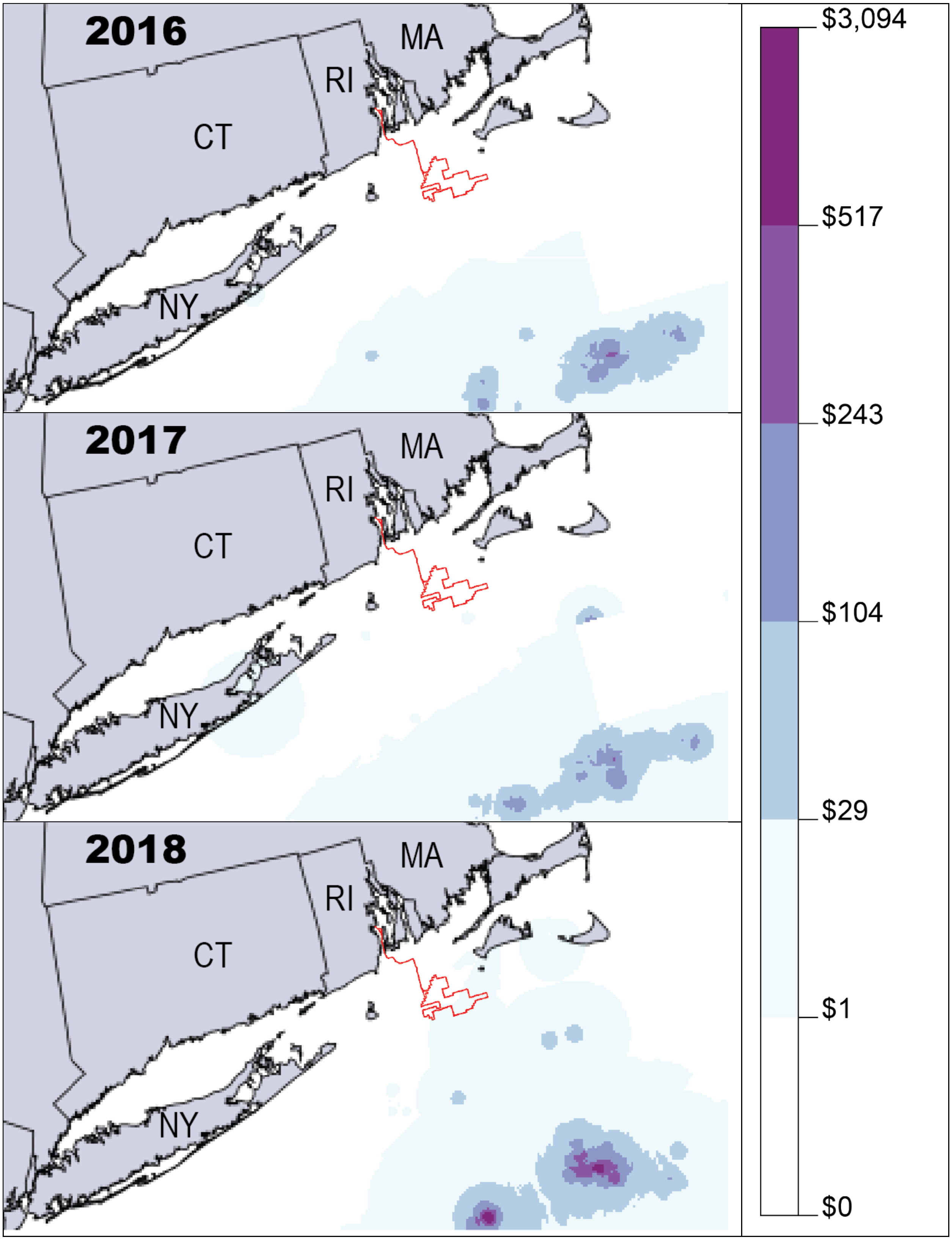

Figure G-4. Revenue Intensity for the Golden Tilefish Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

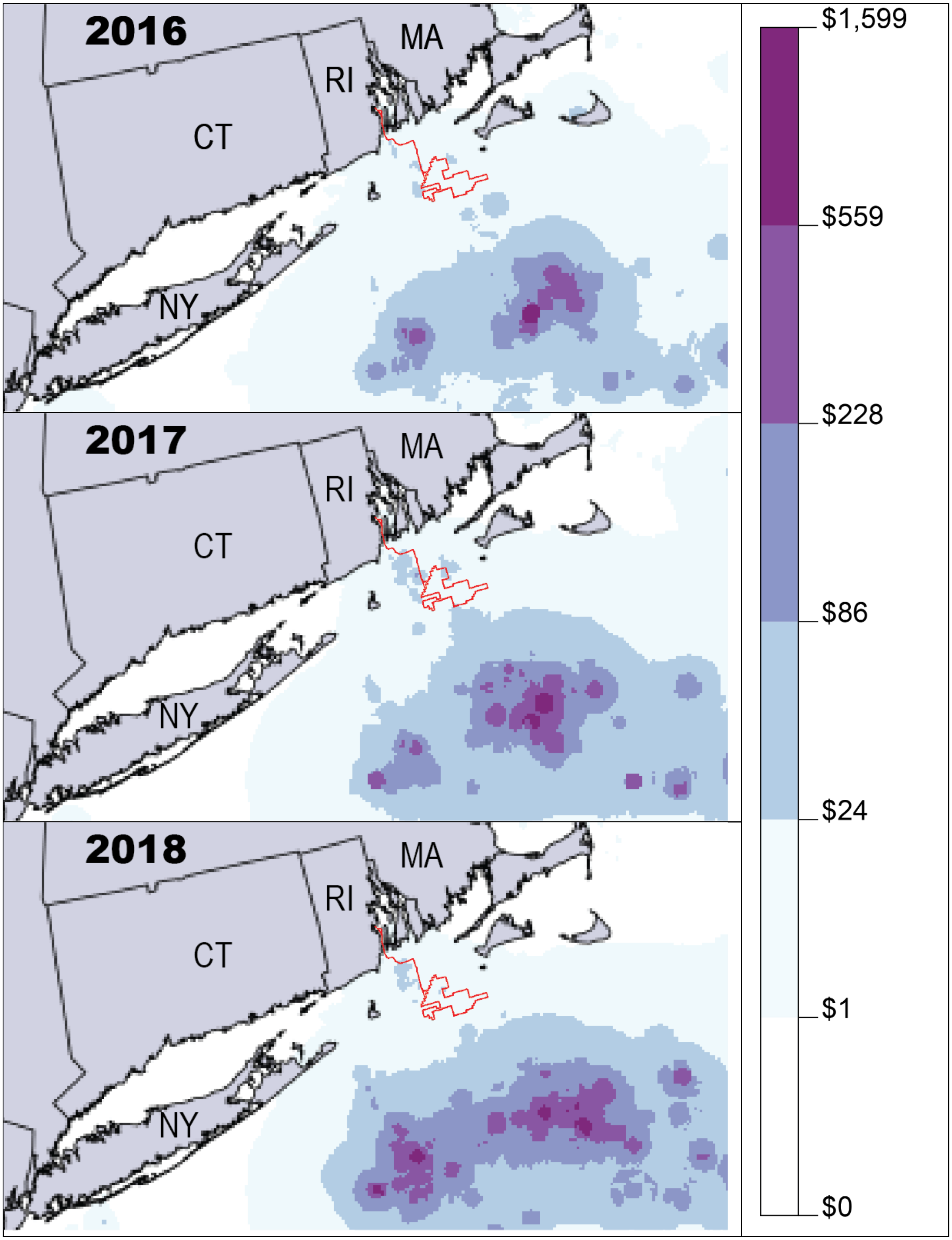

Figure G-5. Revenue Intensity for the Jonah Crab Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

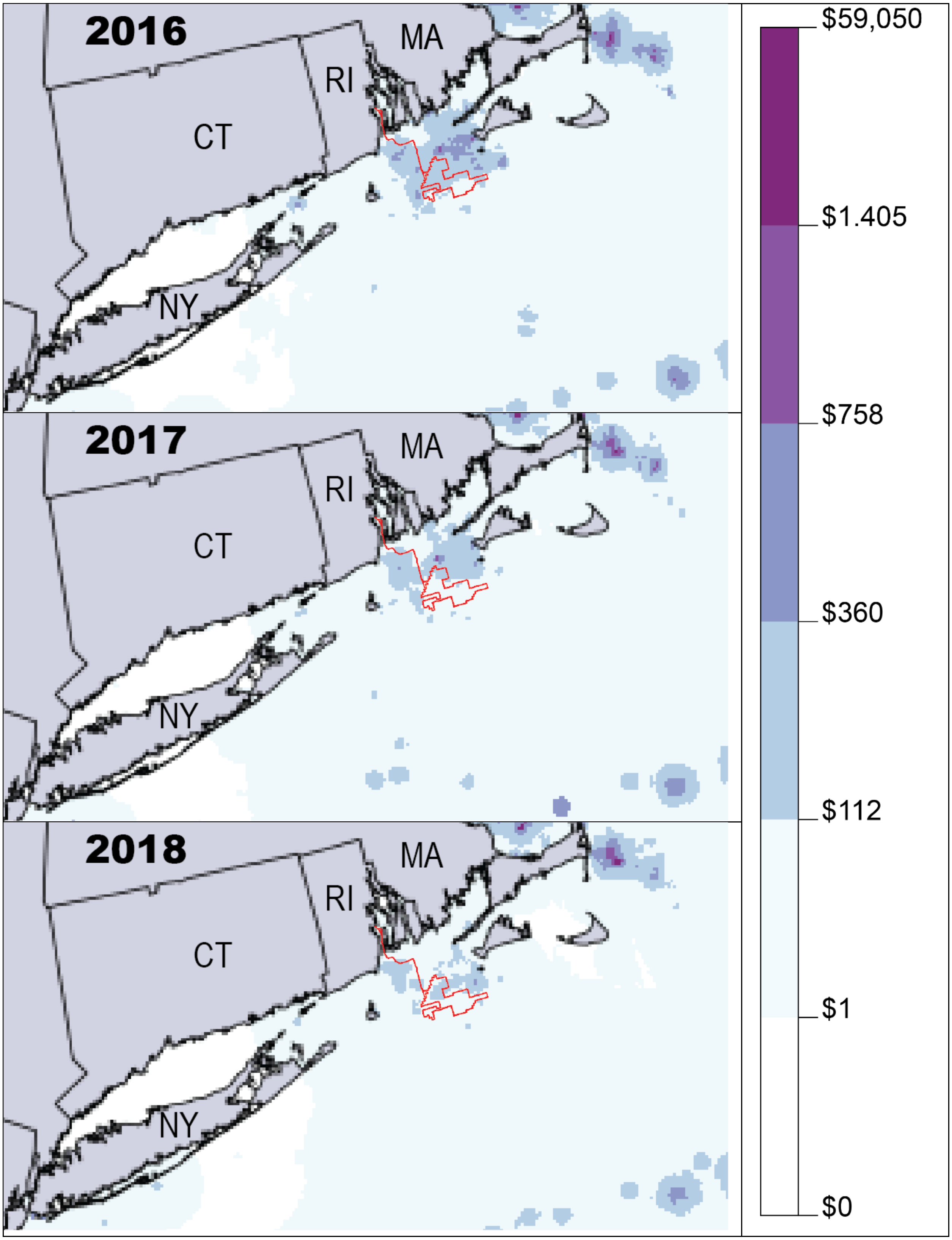

Figure G-6. Revenue Intensity for the Mackerel, Squid, and Butterfish Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

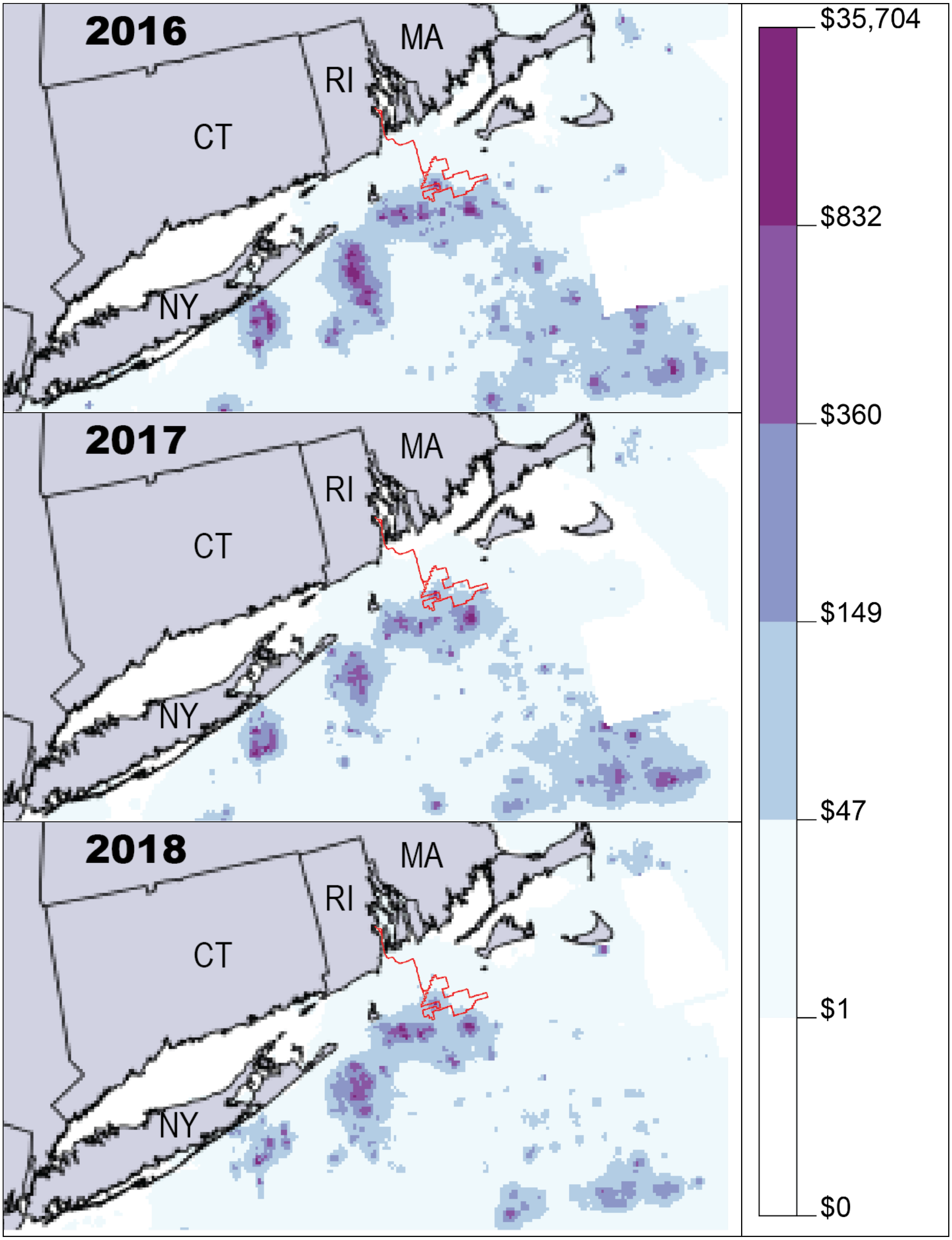

Figure G-7. Revenue Intensity for the Monkfish Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

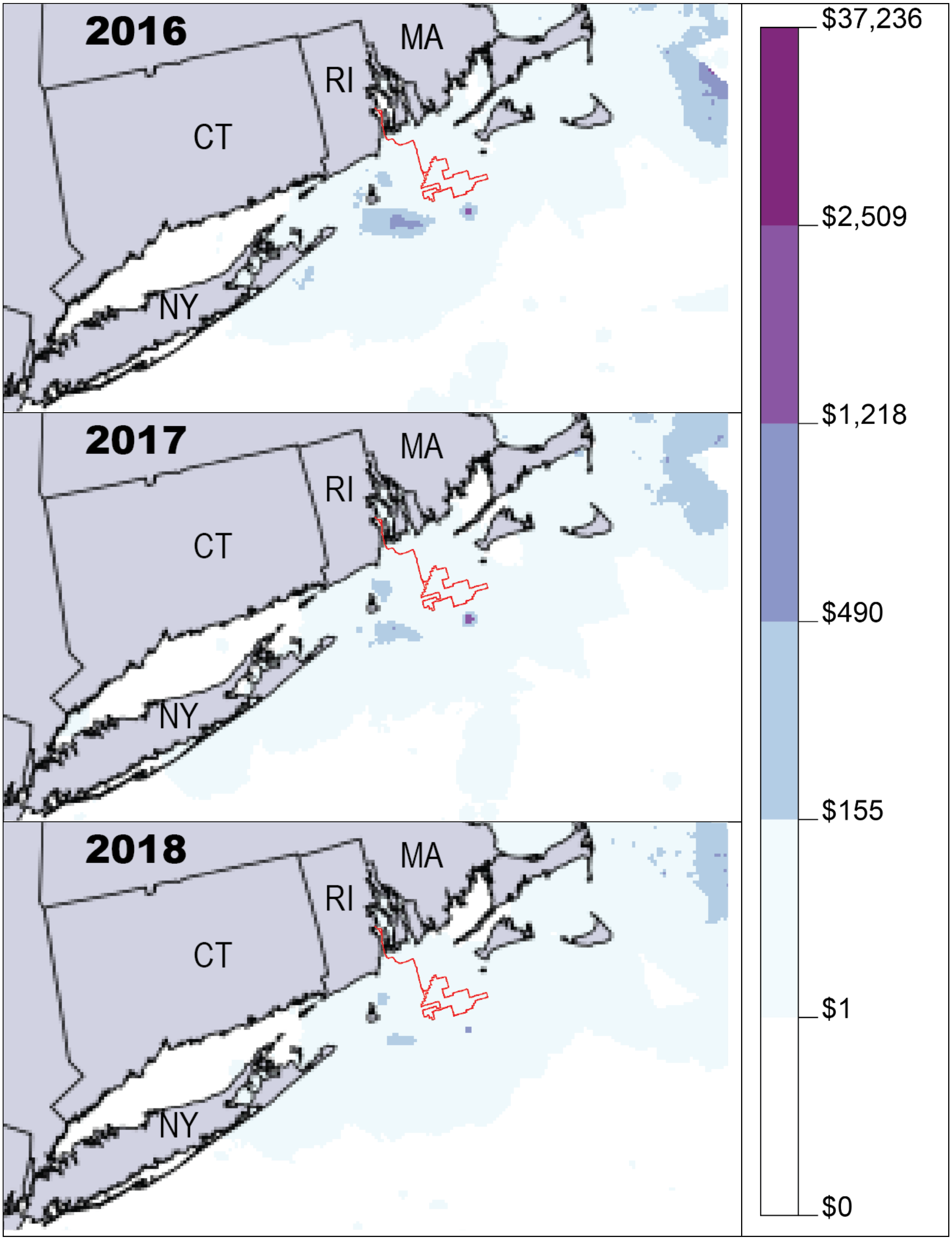

Figure G-8. Revenue Intensity for the Northeast Multispecies (large-mesh) Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

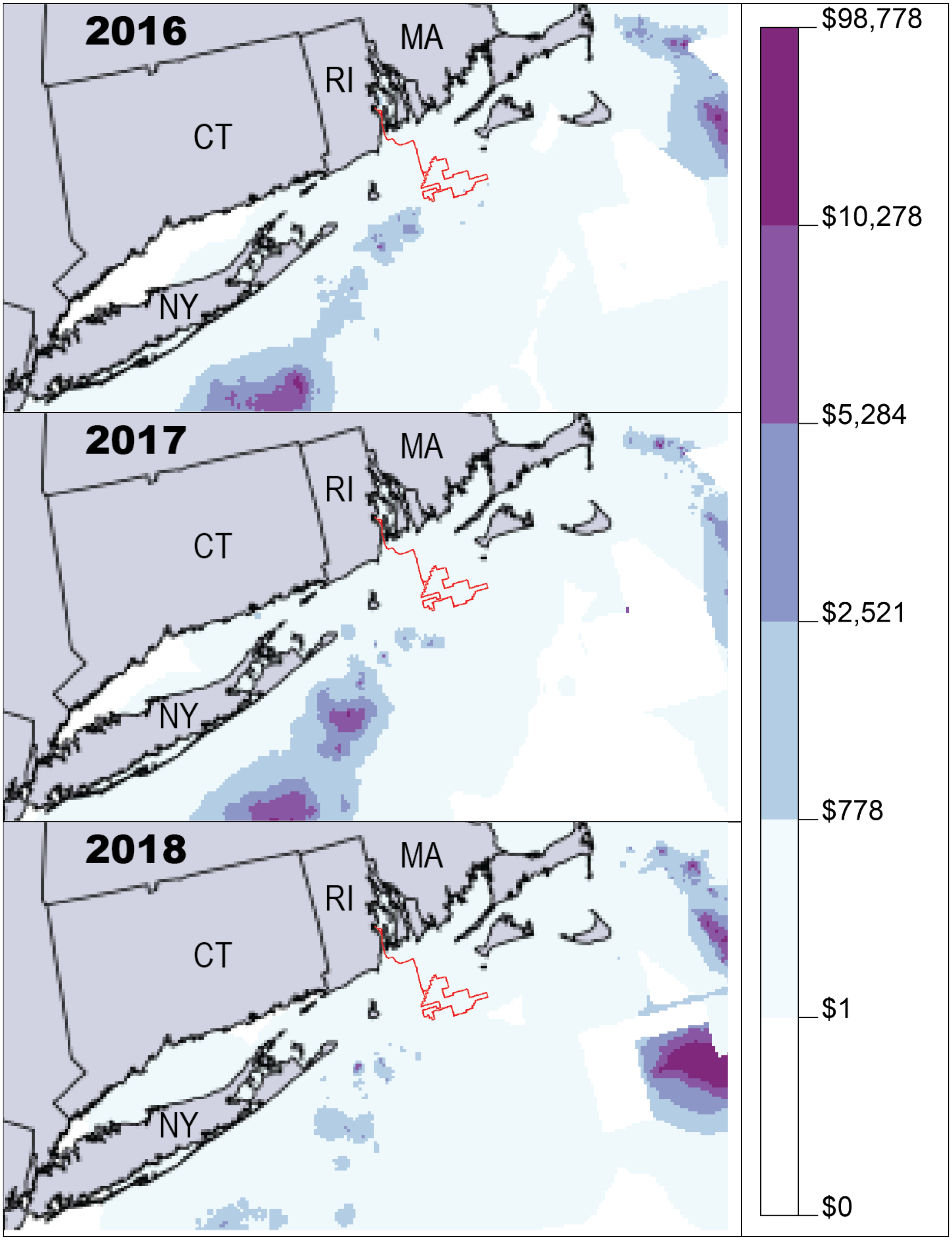

Figure G-9. Revenue Intensity for the Sea Scallop Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

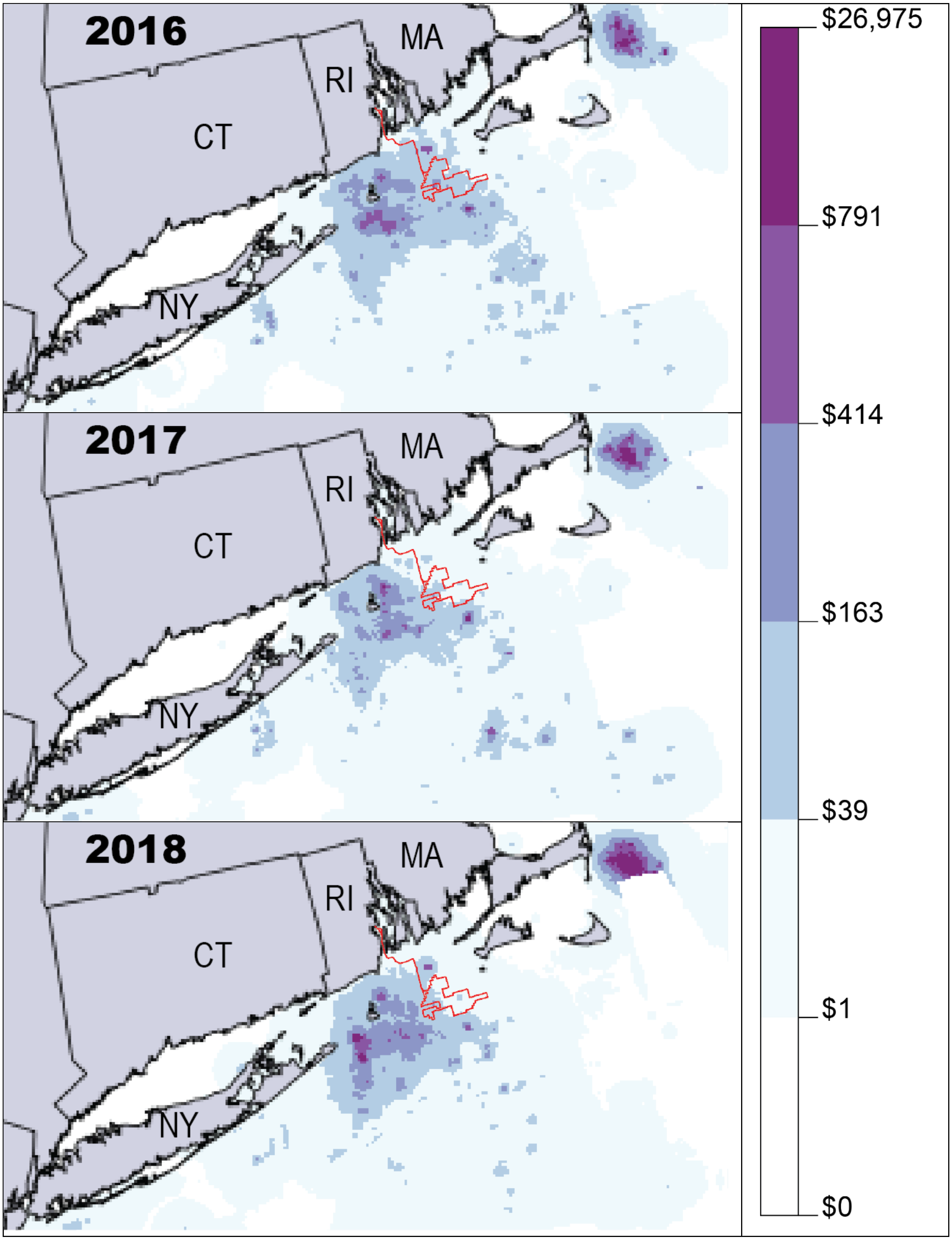

Figure G-10. Revenue Intensity for the Skate Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

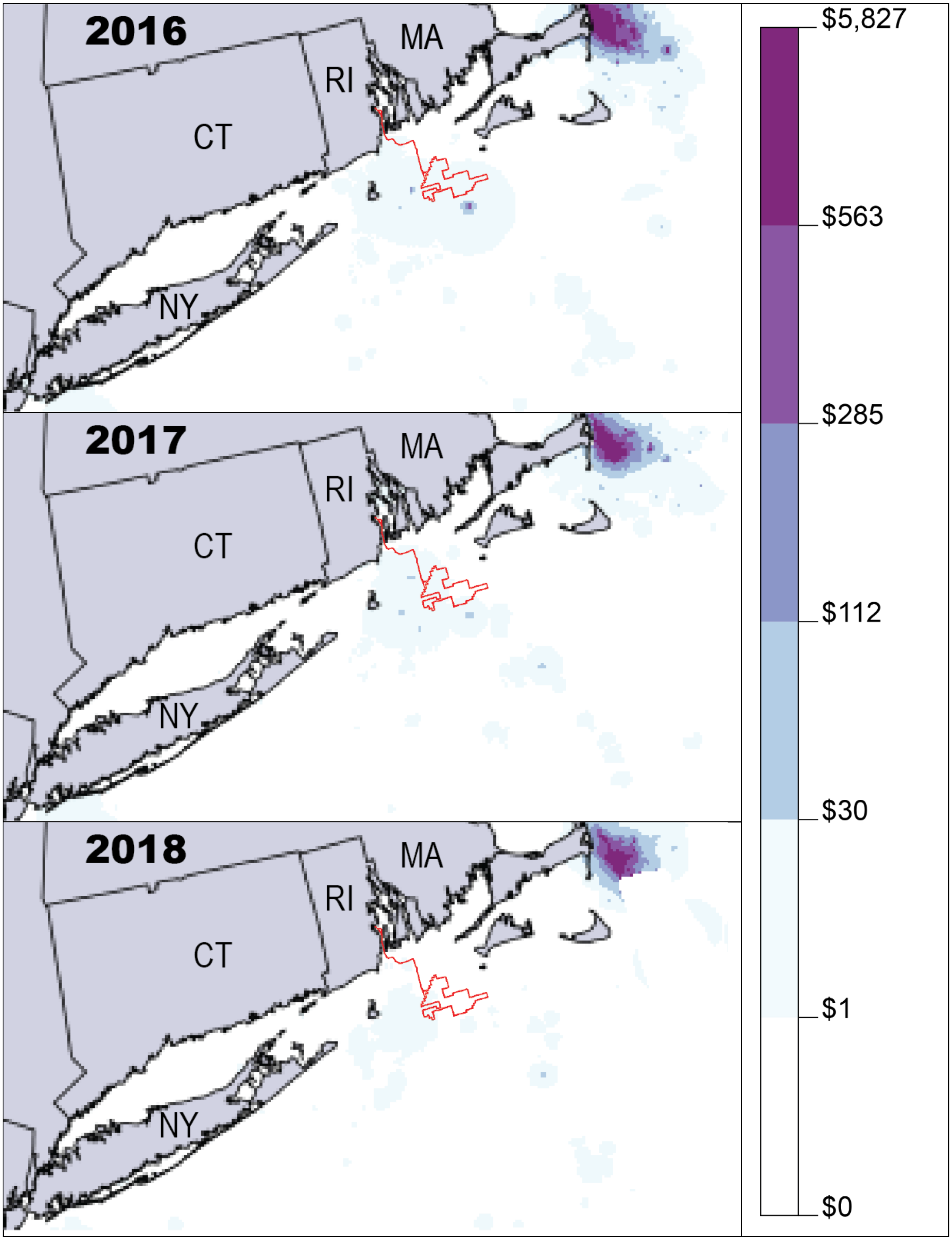

Figure G-11. Revenue Intensity for the Spiny Dogfish Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

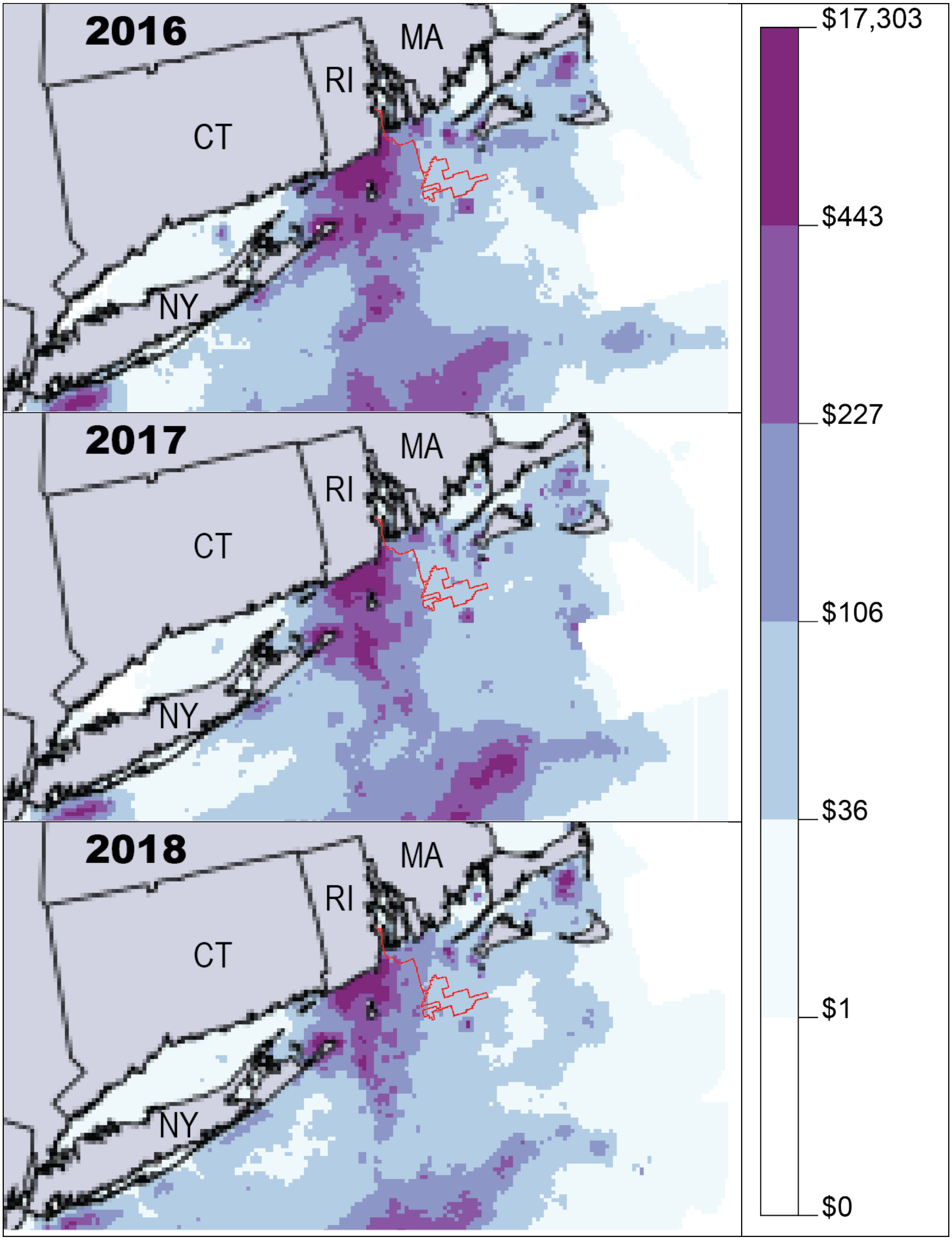

Figure G-12. Revenue Intensity for the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan in the Vicinity of the Lease Area, 2016–2018 (NMFS 2020b).

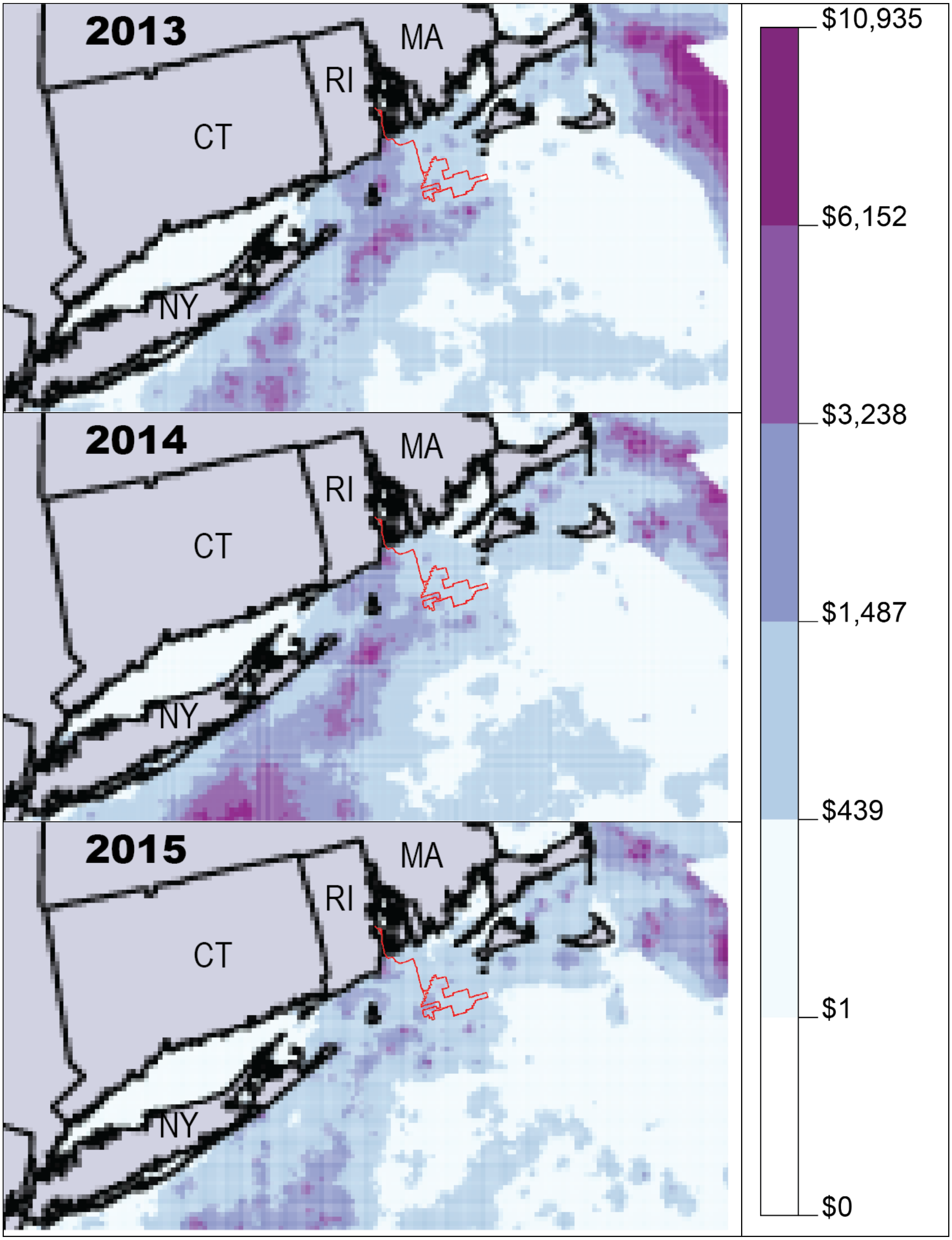

Figure G-13. Revenue Intensity for All Fisheries Combined in the Vicinity of the Lease Area, 2013–2015 (NMFS 2020b).

Analysis of the Economic Dependency on Fishing Grounds in the Lease Area among Commercial Fishing Vessels

To analyze differences in the economic importance of fishing grounds in the Lease Area across the commercial fishing fleet, information was obtained from NMFS (2021c) on the number of federally permitted commercial fishing vessels that fished annually in the Lease Area during the 2008–2019 period, together with box plot figure summarizing the relative dependence of these vessels during that period.

The vessel-level annual revenue percentages were divided into quartiles, which were created by ordering the data from lowest to highest percentage value and then dividing the data into four groups of equal size. The first quartile represents the lowest 25% of ranked percentages while the fourth quartile represents the highest 25%. NMFS (2021c) reported the number of "outlier" vessels in the revenue distribution of percentage of revenue. In the context of this analysis, an outlier is a vessel that derived an exceptionally high proportion of its annual revenue from the Lease Area in comparison to other vessels that fished in the area.[5]

As shown in Table G-2, from 2008 through 2019, an average of 289 vessels per year fished in the Lease Area, with a high of 331 vessels in 2008 and a low of 251 vessels in 2018. The average annual number of outliers was 40.5 (14% of all vessels), with a high of 47 outliers in 2016 (14.6% of all vessels) and a low of 31 outliers in 2019 (11.8% of all vessels).

Table G-2. Number of Federally Permitted Vessels in the Lease Area (2008–2019)

Year	Number of Vessels	Number of Outliers	Number of Outliers as a Percentage of Total Vessels
2008	331	46	13.9%
2009	308	43	14.0%
2010	253	35	13.8%
2011	262	31	11.8%
2012	282	40	14.2%
2013	308	41	13.3%
2014	308	46	14.9%
2015	296	40	13.5%
2016	322	47	14.6%
2017	284	40	14.1%

[5] Technically, an outlier in a box plot distribution is an observation that is more than 1.5 times the length of the box away from either the first quartile (Q1) or third quartile (Q3). Specifically, if an observation is less than Q1 – (1.5 × IQR) or greater than Q3 + (1.5 × IQR), it is an outlier; where IQR = interquartile range = Q3 – Q1.

Year	Number of Vessels	Number of Outliers	Number of Outliers as a Percentage of Total Vessels
2018	251	35	13.9%
2019	261	42	16.1%
Average	288	40	14.0%

Source: NMFS (2021c).

More detailed information about the distribution of the vessel-level annual revenue percentages is provided in the boxplot below (see Figure G-14). The box plot begins at the first quartile, or the value beneath which 25% of all vessel-level revenue percentages fall. A thick line within the box identifies the median, the observation at which 50% of vessel-level revenue percentages are above or beneath. The box ends at the third quartile, or the vessel-level revenue percentage beneath which 75% of observations fall. Nonparametric estimates of the minimum and maximum values are also indicated by the "whiskers" (dashed line terminating in a vertical line) that jut out from each side of the box. Any points outside of these whiskers are vessel-level revenue percentages that are considered outliers.

From 2008 through 2019, the vessel ranked as the seventy-fifth percentile vessel (i.e., the vessel in the third quartile with the greatest dependence on the Lease Area over the 12-year period) derived 0.88% of its total revenue from the Lease Area (NMFS 2021c). Of the outliers, the vessel with the greatest dependence on the Lease Area derived 38% of its total revenue from the area. Looking at individual years shown in the box plot, in 2008, one vessel derived nearly 60% of its total revenue from the Lease Area. In that same year, the vessel with the greatest percentage of dependence in the third quartile generated approximately 2.2% of its revenue from the Lease Area. Figure G-14 shows that in any given year the revenue percentage for the majority of outliers were below 10%.

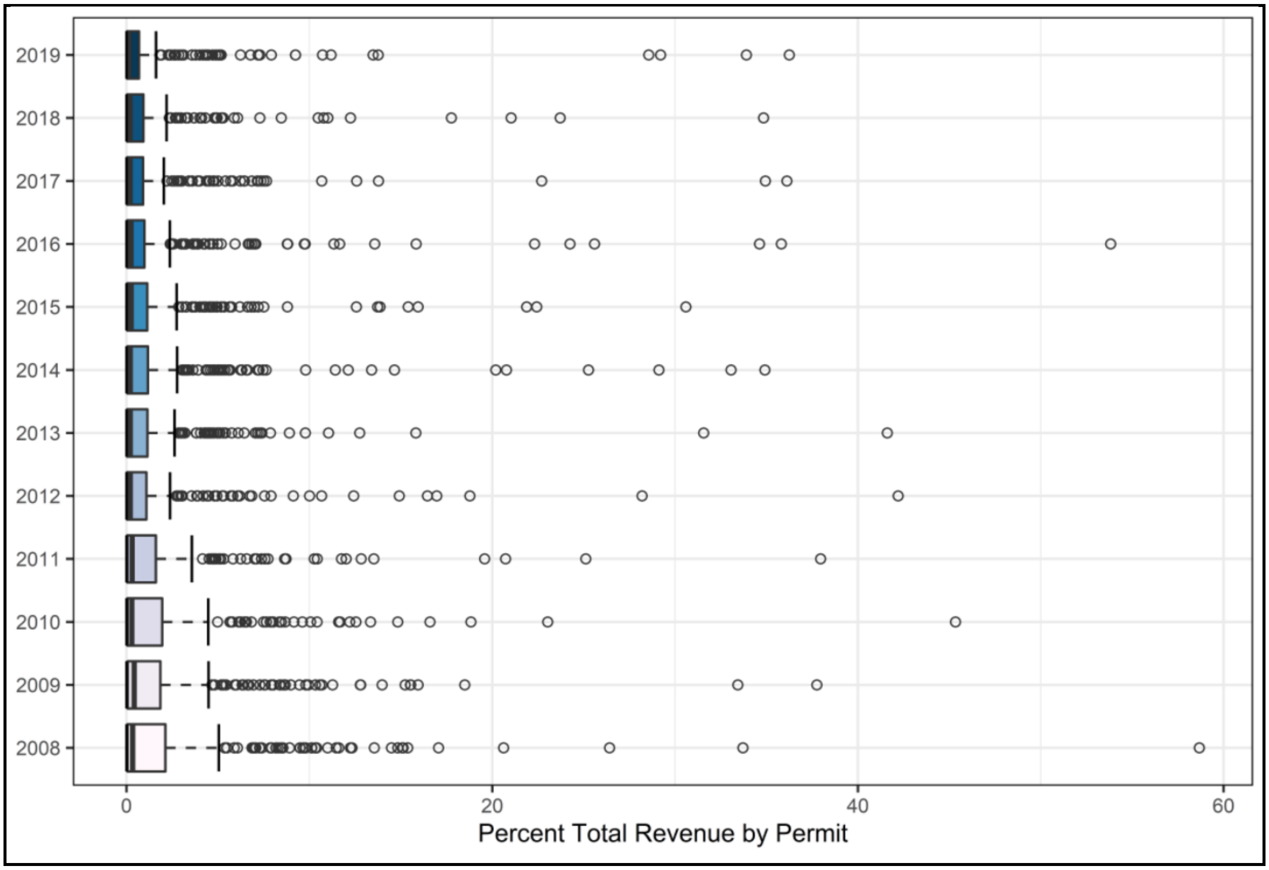

Figure G-14. Percentage of Total Commercial Fishing Revenue of Federally Permitted Vessels Derived from the Lease Area by Vessel (2008–2019) (NMFS 2021c).

It is important to note that the box plot data do not provide any information about total revenues, or if there are correlations between the relative dependence on the lease area and total revenue of the individual vessel. To that end, additional data will be requested from NMFS that will indicate for each quartile and for the outliers as a group the total revenue for the quartile/outlier group from within the Lease Area (i.e., the average numerator) as well as the total revenue from all areas (i.e., average denominator) for the quartile/outlier group.

Annual Commercial Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery, Port, and Gear under Alternatives C, D, and E

Alternative C

FMP Fishery

Table G-3. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative C1 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$462.9	$261.8	0.28%	3.36%
Atlantic Herring	$267.1	$100.9	0.39%	3.37%
Bluefish	$17.0	$8.6	0.67%	1.47%
Highly Migratory Species	$6.8	$2.2	0.10%	0.98%
Jonah Crab	$37.8	$21.4	0.22%	0.36%
Mackerel, Squid, and Butterfish	$296.6	$136.4	0.26%	0.88%
Monkfish	$179.0	$97.9	0.48%	1.30%
Northeast Multispecies (large-mesh)	$112.3	$48.9	0.07%	2.05%
Northeast Multispecies (small-mesh)	$189.0	$71.1	0.63%	2.52%
Sea Scallop	$367.9	$143.7	0.03%	0.29%
Skates	$160.5	$102.1	1.37%	2.85%
Spiny Dogfish	$35.2	$15.2	0.51%	6.22%
Summer Flounder, Scup, Black Sea Bass	$126.3	$80.5	0.20%	0.73%
Other FMPs, non-disclosed species and non-FMP fisheries	$550.4	$235.4	0.25%	0.70%
All FMP and non-FMP Fisheries	$1,610.9	$1,326.0	0.14%	0.92%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-4. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative C2 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$428.1	$246.0	0.26%	3.15%
Atlantic Herring	$261.1	$99.2	0.38%	3.31%
Bluefish	$16.8	$8.5	0.67%	1.46%
Highly Migratory Species	$6.6	$2.1	0.09%	0.95%
Jonah Crab	$36.0	$20.3	0.21%	0.35%
Mackerel, Squid, and Butterfish	$279.7	$130.7	0.25%	0.85%
Monkfish	$166.4	$92.6	0.45%	1.23%
Northeast Multispecies (large-mesh)	$109.3	$47.1	0.06%	1.97%
Northeast Multispecies (small-mesh)	$185.3	$69.2	0.61%	2.45%
Sea Scallop	$354.5	$138.1	0.03%	0.28%
Skates	$152.3	$97.0	1.30%	2.71%
Spiny Dogfish	$34.6	$14.7	0.49%	6.03%
Summer Flounder, Scup, Black Sea Bass	$121.9	$77.8	0.20%	0.71%
Other FMPs, non-disclosed species and non-FMP fisheries	$534.3	$227.5	0.24%	0.67%
All FMP and non-FMP Fisheries	$1,546.5	$1,270.8	0.13%	0.88%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Port

Table G-5. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative C1 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$712.4	$547.3	1.19%	1.99%
New Bedford, MA	$566.0	$340.1	0.09%	0.70%
Little Compton, RI	$192.5	$131.8	6.62%	6.79%
Westport, MA	$107.0	$58.2	4.46%	4.98%
Newport, RI	$188.0	$104.1	1.17%	3.61%
Chilmark/Menemsha, MA	$23.4	$14.3	3.04%	3.41%
Fairhaven, MA	*$27.1*	*$14.4*	*0.13%*	*1.00%*
Montauk, NY	$38.4	$17.0	0.09%	0.14%
Fall River, MA	*$17.6*	*$8.9*	*0.78%*	*2.00%*
Tiverton, RI	$15.0	$6.4	0.56%	0.98%
Other Ports, MA	*$16.3*	*$7.9*	*0.01%*	*0.16%*
Point Pleasant, NJ	*$15.6*	*$4.5*	*0.01%*	*0.05%*
Newport News, VA	*$15.3*	*$3.8*	*0.01%*	*0.22%*
Beaufort, NC	*$5.0*	*$2.4*	*0.09%*	*0.28%*
Hampton, VA	*$7.1*	*$3.5*	*0.02%*	*0.22%*
Other New England/Mid-Atlantic ports*	$145.7	$80.7	0.03%	0.27%
All New England/Mid-Atlantic Ports	$1,610.9	$1,345.2	0.14%	0.93%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-6. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative C2 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$691.4	$531.0	1.15%	1.93%
New Bedford, MA	$549.2	$325.4	0.09%	0.67%
Little Compton, RI	$186.3	$126.9	6.37%	6.54%
Westport, MA	$87.8	$49.5	3.79%	4.23%
Newport, RI	$184.1	$100.9	1.13%	3.50%
Chilmark/Menemsha, MA	$20.9	$12.6	2.67%	2.99%
Fairhaven, MA	*$25.6*	*$13.7*	*0.12%*	*0.95%*
Montauk, NY	$36.1	$16.1	0.09%	0.14%
Fall River, MA	*$17.1*	*$8.7*	*0.77%*	*1.95%*
Tiverton, RI	$14.3	$6.1	0.53%	0.94%
Other Ports, MA	*$16.1*	*$7.6*	*0.01%*	*0.16%*
Point Pleasant, NJ	*$14.0*	*$4.1*	*0.01%*	*0.05%*
Newport News, VA	*$14.6*	*$3.6*	*0.01%*	*0.21%*
Beaufort, NC	*$4.7*	*$2.2*	*0.08%*	*0.26%*
Hampton, VA	*$6.6*	*$3.2*	*0.02%*	*0.21%*
Other New England/Mid-Atlantic ports*	$142.2	$77.7	0.03%	0.26%
All New England/Mid-Atlantic Ports	$1,546.5	$1,289.3	0.14%	0.89%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Gear

Table G-7. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative C1 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$388.3	$114.0	0.19%	0.55%
Dredge-scallop	$370.1	$144.2	0.03%	0.30%
Gillnet-sink	$260.6	$178.9	0.60%	1.86%
Handline	$12.3	$3.2	0.07%	0.24%
Pot-other	$482.2	$319.1	0.28%	1.98%
Trawl-bottom	$621.2	$467.3	0.25%	1.09%
Trawl-midwater	$187.1	$96.0	0.51%	4.09%
All other gear*	$282.2	$66.7	0.14%	2.50%
All gear types	$1,611.0	$1,389.5	0.15%	0.96%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-8. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative C2 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$381.6	$111.3	0.18%	0.53%
Dredge-scallop	$356.6	$138.6	0.03%	0.29%
Gillnet-sink	$241.8	$170.2	0.57%	1.77%
Handline	$11.3	$3.1	0.07%	0.23%
Pot-other	$445.6	$299.4	0.26%	1.86%
Trawl-bottom	$596.7	$451.2	0.24%	1.05%
Trawl-midwater	$182.1	$94.3	0.50%	4.02%
All other gear*	$275.9	$64.8	0.14%	2.43%
All gear types	$1,546.5	$1,333.0	0.14%	0.92%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Alternative D

FMP Fishery

Table G-9. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D1 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$492.7	$274.2	0.29%	3.52%
Atlantic Herring	$270.5	$101.8	0.39%	3.40%
Bluefish	$17.0	$8.6	0.67%	1.47%
Highly Migratory Species	$6.6	$2.1	0.10%	0.97%
Jonah Crab	$38.4	$22.0	0.23%	0.37%
Mackerel, Squid, and Butterfish	$306.4	$139.7	0.27%	0.91%
Monkfish	$186.9	$98.4	0.48%	1.31%
Northeast Multispecies (large-mesh)	$113.1	$48.8	0.07%	2.04%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Northeast Multispecies (small-mesh)	$190.7	$71.6	0.64%	2.53%
Sea Scallop	$338.6	$136.5	0.03%	0.27%
Skates	$166.5	$104.5	1.40%	2.92%
Spiny Dogfish	$35.2	$15.3	0.51%	6.27%
Summer Flounder, Scup, Black Sea Bass	$127.4	$81.5	0.20%	0.74%
Other FMPs, non-disclosed species and non-FMP fisheries	$567.3	$238.2	0.25%	0.71%
All FMP and non-FMP Fisheries	$1,632.7	$1,343.1	0.14%	0.93%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-10. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D2 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$496.8	$272.5	0.29%	3.49%
Atlantic Herring	$271.7	$102.3	0.39%	3.42%
Bluefish	$17.2	$8.7	0.68%	1.49%
Highly Migratory Species	$6.9	$2.2	0.10%	0.99%
Jonah Crab	$39.6	$22.5	0.23%	0.38%
Mackerel, Squid, and Butterfish	$305.4	$140.2	0.27%	0.91%
Monkfish	$201.8	$104.1	0.51%	1.38%
Northeast Multispecies (large-mesh)	$115.9	$51.5	0.07%	2.16%
Northeast Multispecies (small-mesh)	$192.5	$73.5	0.65%	2.60%
Sea Scallop	$371.8	$147.5	0.03%	0.30%
Skates	$168.7	$106.1	1.42%	2.96%
Spiny Dogfish	$35.7	$15.5	0.52%	6.36%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Summer Flounder, Scup, Black Sea Bass	$130.8	$83.0	0.21%	0.75%
Other FMPs, non-disclosed species and non-FMP fisheries	$571.6	$242.6	0.26%	0.72%
All FMP and non-FMP Fisheries	$1,662.1	$1,372.2	0.14%	0.95%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-11. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D3 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$479.9	$268.5	0.29%	3.44%
Atlantic Herring	$260.1	$97.7	0.38%	3.26%
Bluefish	$16.3	$8.5	0.66%	1.45%
Highly Migratory Species	$6.8	$2.1	0.10%	0.97%
Jonah Crab	$37.8	$21.8	0.23%	0.37%
Mackerel, Squid, and Butterfish	$308.8	$138.1	0.27%	0.90%
Monkfish	$205.9	$107.1	0.52%	1.42%
Northeast Multispecies (large-mesh)	$112.5	$50.0	0.07%	2.09%
Northeast Multispecies (small-mesh)	$167.1	$66.5	0.59%	2.36%
Sea Scallop	$405.1	$152.1	0.03%	0.31%
Skates	$170.3	$106.4	1.43%	2.97%
Spiny Dogfish	$31.5	$14.3	0.48%	5.87%
Summer Flounder, Scup, Black Sea Bass	$127.6	$79.9	0.20%	0.73%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other FMPs, non-disclosed species and non-FMP fisheries	$530.9	$235.3	0.25%	0.70%
All FMP and non-FMP Fisheries	$1,631.0	$1,348.4	0.14%	0.94%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-12. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D1+D2 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$481.8	$262.8	0.28%	3.37%
Atlantic Herring	$268.8	$101.2	0.39%	3.38%
Bluefish	$17.0	$8.6	0.67%	1.47%
Highly Migratory Species	$6.6	$2.1	0.10%	0.96%
Jonah Crab	$37.4	$21.3	0.22%	0.36%
Mackerel, Squid, and Butterfish	$287.3	$134.6	0.26%	0.87%
Monkfish	$178.6	$92.5	0.45%	1.23%
Northeast Multispecies (large-mesh)	$112.1	$47.8	0.07%	2.00%
Northeast Multispecies (small-mesh)	$189.9	$70.8	0.63%	2.51%
Sea Scallop	$294.9	$127.0	0.02%	0.26%
Skates	$159.3	$99.8	1.34%	2.79%
Spiny Dogfish	$35.1	$15.1	0.51%	6.19%
Summer Flounder, Scup, Black Sea Bass	$124.8	$80.3	0.20%	0.73%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other FMPs, non-disclosed species and non-FMP fisheries	$564.3	$232.8	0.25%	0.69%
All FMP and non-FMP Fisheries	$1,587.0	$1,296.5	0.14%	0.90%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-13. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D1+D3 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$464.9	$258.8	0.28%	3.32%
Atlantic Herring	$257.1	$96.6	0.37%	3.23%
Bluefish	$16.2	$8.3	0.65%	1.43%
Highly Migratory Species	$6.4	$2.1	0.09%	0.93%
Jonah Crab	$35.5	$20.7	0.22%	0.35%
Mackerel, Squid, and Butterfish	$290.7	$132.5	0.26%	0.86%
Monkfish	$182.8	$95.5	0.46%	1.27%
Northeast Multispecies (large-mesh)	$108.7	$46.2	0.06%	1.94%
Northeast Multispecies (small-mesh)	$164.5	$63.8	0.57%	2.26%
Sea Scallop	$328.3	$131.5	0.03%	0.26%
Skates	$160.9	$100.1	1.34%	2.80%
Spiny Dogfish	$31.0	$13.9	0.47%	5.69%
Summer Flounder, Scup, Black Sea Bass	$121.6	$77.2	0.19%	0.70%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other FMPs, non-disclosed species and non-FMP fisheries	$523.6	$225.4	0.24%	0.67%
All FMP and non-FMP Fisheries	$1,556.0	$1,272.7	0.13%	0.88%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-14. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D2+D3 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$468.9	$257.1	0.28%	3.30%
Atlantic Herring	$258.3	$97.1	0.37%	3.24%
Bluefish	$16.3	$8.4	0.66%	1.44%
Highly Migratory Species	$6.7	$2.1	0.10%	0.96%
Jonah Crab	$36.8	$21.1	0.22%	0.36%
Mackerel, Squid, and Butterfish	$289.7	$133.0	0.26%	0.86%
Monkfish	$197.7	$101.2	0.49%	1.35%
Northeast Multispecies (large-mesh)	$111.4	$49.0	0.07%	2.05%
Northeast Multispecies (small-mesh)	$166.3	$65.8	0.58%	2.33%
Sea Scallop	$367.0	$142.5	0.03%	0.29%
Skates	$163.1	$101.8	1.37%	2.84%
Spiny Dogfish	$31.4	$14.1	0.47%	5.78%
Summer Flounder, Scup, Black Sea Bass	$124.9	$78.7	0.20%	0.72%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other FMPs, non-disclosed species and non-FMP fisheries	$528.0	$229.9	0.24%	0.68%
All FMP and non-FMP Fisheries	$1,585.3	$1,301.8	0.14%	0.90%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-15. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative D1+D2+D3 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$454.0	$247.4	0.27%	3.17%
Atlantic Herring	$255.4	$96.0	0.37%	3.21%
Bluefish	$16.1	$8.3	0.65%	1.42%
Highly Migratory Species	$6.4	$2.0	0.09%	0.93%
Jonah Crab	$34.5	$20.0	0.21%	0.34%
Mackerel, Squid, and Butterfish	$271.7	$127.4	0.25%	0.83%
Monkfish	$174.6	$89.7	0.44%	1.19%
Northeast Multispecies (large-mesh)	$107.6	$45.2	0.06%	1.89%
Northeast Multispecies (small-mesh)	$163.7	$63.1	0.56%	2.24%
Sea Scallop	$290.1	$121.9	0.02%	0.25%
Skates	$153.7	$95.5	1.28%	2.67%
Spiny Dogfish	$30.9	$13.7	0.46%	5.60%
Summer Flounder, Scup, Black Sea Bass	$118.9	$75.9	0.19%	0.69%

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other FMPs, non-disclosed species and non-FMP fisheries	$520.7	$220.0	0.23%	0.65%
All FMP and non-FMP Fisheries	$1,510.3	$1,226.1	0.13%	0.85%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Port

Table G-16. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D1 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$719.1	$552.4	1.20%	2.01%
New Bedford, MA	$579.7	$340.3	0.09%	0.70%
Little Compton, RI	$203.7	$135.0	6.78%	6.96%
Westport, MA	$115.5	$62.3	4.77%	5.33%
Newport, RI	$188.3	$105.1	1.18%	3.65%
Chilmark/Menemsha, MA	$26.4	$16.0	3.40%	3.82%
Fairhaven, MA	*$27.7*	*$14.6*	*0.13%*	*1.01%*
Montauk, NY	$39.6	$17.2	0.09%	0.15%
Fall River, MA	*$18.0*	*$9.0*	*0.79%*	*2.02%*
Tiverton, RI	$14.0	$6.2	0.54%	0.95%
Other Ports, MA	*$16.1*	*$7.7*	*0.01%*	*0.16%*
Point Pleasant, NJ	*$16.3*	*$4.6*	*0.01%*	*0.05%*
Newport News, VA	*$15.5*	*$3.9*	*0.01%*	*0.23%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Beaufort, NC	*$5.1*	*$2.5*	*0.09%*	*0.29%*
Hampton, VA	*$7.2*	*$3.6*	*0.02%*	*0.23%*
Other New England/Mid-Atlantic ports*	$111.9	$55.9	0.02%	0.19%
All New England/Mid-Atlantic Ports	$1,591.9	$1,336.5	0.14%	0.93%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-17. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D2 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$734.9	$567.4	1.23%	2.06%
New Bedford, MA	$574.6	$346.6	0.09%	0.71%
Little Compton, RI	$218.9	$142.0	7.13%	7.32%
Westport, MA	$117.3	$65.9	5.05%	5.63%
Newport, RI	$192.8	$107.5	1.21%	3.73%
Chilmark/Menemsha, MA	$26.1	$13.9	2.95%	3.31%
Fairhaven, MA	*$19.3*	*$8.9*	*0.08%*	*0.62%*
Montauk, NY	$39.9	$18.0	0.10%	0.15%
Fall River, MA	*$18.0*	*$9.1*	*0.80%*	*2.03%*
Tiverton, RI	*$17.0*	*$7.7*	*0.67%*	*1.18%*
Other Ports, MA	$12.5	ND	ND	ND
Point Pleasant, NJ	*$16.4*	*$4.7*	*0.02%*	*0.05%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Newport News, VA	*$15.6*	*$3.9*	*0.01%*	*0.23%*
Beaufort, NC	*$5.1*	*$2.5*	*0.09%*	*0.29%*
Hampton, VA	*$7.7*	*$3.7*	*0.03%*	*0.24%*
Other New England/Mid-Atlantic ports*	$112.3	$66.2	0.02%	0.22%
All New England/Mid-Atlantic Ports	$1,621.3	$1,367.9	0.14%	0.95%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-18. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D3 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$698.7	$539.0	1.17%	1.96%
New Bedford, MA	$553.3	$353.3	0.09%	0.73%
Little Compton, RI	$213.0	$136.6	6.86%	7.04%
Westport, MA	$116.2	$65.2	5.00%	5.58%
Newport, RI	$186.5	$105.0	1.18%	3.64%
Chilmark/Menemsha, MA	$28.6	$16.7	3.54%	3.97%
Fairhaven, MA	*$29.1*	*$15.2*	*0.13%*	*1.05%*
Montauk, NY	$40.8	$17.9	0.10%	0.15%
Fall River, MA	$17.6	ND	ND	ND
Tiverton, RI	*$17.4*	*$7.3*	*0.63%*	*1.11%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Other Ports, MA	*$15.9*	*$6.8*	*0.01%*	*0.14%*
Point Pleasant, NJ	*$16.0*	*$4.5*	*0.01%*	*0.05%*
Newport News, VA	*$14.7*	*$3.8*	*0.01%*	*0.22%*
Beaufort, NC	*$5.2*	*$2.5*	*0.10%*	*0.29%*
Hampton, VA	*$7.9*	*$3.8*	*0.03%*	*0.24%*
Other New England/Mid-Atlantic ports*	$107.0	$64.4	0.02%	0.22%
All New England/Mid-Atlantic Ports	$1,591.1	$1,341.8	0.14%	0.93%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-19. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D1+D2 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$707.4	$545.6	1.18%	1.98%
New Bedford, MA	$558.1	$317.5	0.08%	0.65%
Little Compton, RI	$202.8	$133.7	6.71%	6.89%
Westport, MA	$111.8	$61.0	4.68%	5.22%
Newport, RI	$187.1	$103.7	1.17%	3.60%
Chilmark/Menemsha, MA	$23.3	$12.9	2.75%	3.08%
Fairhaven, MA	*$17.2*	*$8.1*	*0.07%*	*0.56%*
Montauk, NY	$36.7	$16.4	0.09%	0.14%
Fall River, MA	*$17.8*	*$8.9*	*0.78%*	*2.00%*
Tiverton, RI	*$13.6*	*$6.7*	*0.58%*	*1.02%*
Other Ports, MA	$12.1	ND	ND	ND

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Pleasant, NJ	*$15.9*	*$4.5*	*0.01%*	*0.05%*
Newport News, VA	*$14.9*	*$3.7*	*0.01%*	*0.22%*
Beaufort, NC	*$4.8*	*$2.3*	*0.09%*	*0.27%*
Hampton, VA	*$6.7*	*$3.3*	*0.02%*	*0.21%*
Other New England/Mid-Atlantic ports*	$107.4	$62.4	0.02%	0.21%
All New England/Mid-Atlantic Ports	$1,546.2	$1,290.9	0.14%	0.89%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-20. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D1+D3 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$671.3	$517.2	1.12%	1.88%
New Bedford, MA	$536.9	$324.2	0.09%	0.67%
Little Compton, RI	$196.9	$128.4	6.45%	6.62%
Westport, MA	$110.7	$60.4	4.63%	5.17%
Newport, RI	$180.8	$101.2	1.14%	3.51%
Chilmark/Menemsha, MA	$25.8	$15.7	3.33%	3.74%
Fairhaven, MA	*$27.1*	*$14.3*	*0.13%*	*0.99%*
Montauk, NY	$37.6	$16.3	0.09%	0.14%
Fall River, MA	$17.3	ND	ND	ND
Tiverton, RI	*$13.6*	*$6.3*	*0.54%*	*0.96%*
Other Ports, MA	*$15.2*	*$6.3*	*0.01%*	*0.13%*
Point Pleasant, NJ	*$15.6*	*$4.3*	*0.01%*	*0.05%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Newport News, VA	*$14.0*	*$3.6*	*0.01%*	*0.21%*
Beaufort, NC	*$4.9*	*$2.4*	*0.09%*	*0.27%*
Hampton, VA	*$6.9*	*$3.4*	*0.02%*	*0.22%*
Other New England/Mid-Atlantic ports*	$102.0	$61.0	0.02%	0.20%
All New England/Mid-Atlantic Ports	$1,514.3	$1,264.9	0.13%	0.88%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-21. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D2+D3 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$687.1	$532.2	1.16%	1.93%
New Bedford, MA	$531.7	$330.5	0.09%	0.68%
Little Compton, RI	$212.0	$135.4	6.79%	6.98%
Westport, MA	$112.5	$63.9	4.90%	5.47%
Newport, RI	$185.3	$103.6	1.16%	3.60%
Chilmark/Menemsha, MA	$25.5	$13.6	2.88%	3.23%
Fairhaven, MA	*$18.7*	*$8.6*	*0.08%*	*0.60%*
Montauk, NY	$37.9	$17.0	0.09%	0.14%
Fall River, MA	$17.4	ND	ND	ND
Tiverton, RI	*$16.6*	*$7.0*	*0.61%*	*1.08%*
Other Ports, MA	$11.5	ND	ND	ND
Point Pleasant, NJ	*$15.6*	*$4.4*	*0.01%*	*0.05%*
Newport News, VA	*$14.1*	*$3.6*	*0.01%*	*0.21%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Beaufort, NC	*$4.9*	*$2.4*	*0.09%*	*0.28%*
Hampton, VA	*$7.5*	*$3.6*	*0.02%*	*0.23%*
Other New England/Mid-Atlantic ports*	$102.4	$69.2	0.02%	0.23%
All New England/Mid-Atlantic Ports	$1,543.6	$1,295.0	0.14%	0.90%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-22. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative D1+D2+D3 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$659.7	$510.4	1.11%	1.85%
New Bedford, MA	$515.3	$301.4	0.08%	0.62%
Little Compton, RI	$195.9	$127.1	6.38%	6.55%
Westport, MA	$107.0	$59.1	4.53%	5.06%
Newport, RI	$179.5	$99.7	1.12%	3.46%
Chilmark/Menemsha, MA	$22.7	$12.6	2.68%	3.00%
Fairhaven, MA	*$16.6*	*$7.8*	*0.07%*	*0.54%*
Montauk, NY	$34.7	$15.5	0.08%	0.13%
Fall River, MA	$17.1	ND	ND	ND
Tiverton, RI	*$12.9*	*$6.0*	*0.52%*	*0.92%*
Other Ports, MA	$10.8	ND	ND	ND
Point Pleasant, NJ	*$15.1*	*$4.2*	*0.01%*	*0.05%*
Newport News, VA	*$13.5*	*$3.4*	*0.01%*	*0.20%*
Beaufort, NC	*$4.6*	*$2.2*	*0.08%*	*0.26%*

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Hampton, VA	*$6.5*	*$3.2*	*0.02%*	*0.21%*
Other New England/Mid-Atlantic ports*	$97.4	$65.2	0.02%	0.22%
All New England/Mid-Atlantic Ports	$1,468.6	$1,218.0	0.13%	0.84%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data. Vessels with 4 or fewer years of reported data are shown with an ND (non-disclosed) for average revenues and for percentages of other areas.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Gear

Table G-23. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D1 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$369.2	$94.1	0.15%	0.45%
Dredge-scallop	$339.9	$136.8	0.03%	0.28%
Gillnet-sink	$268.6	$180.1	0.60%	1.87%
Handline	$14.8	$3.4	0.07%	0.25%
Pot-other	$514.2	$333.0	0.29%	2.07%
Trawl-bottom	$631.3	$474.3	0.25%	1.10%
Trawl-midwater	$189.8	$97.1	0.51%	4.13%
All other gear*	$283.8	$79.6	0.17%	2.99%
All gear types	$1,632.7	$1,398.5	0.15%	0.97%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-24. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D2 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$371.2	$95.7	0.16%	0.46%
Dredge-scallop	$378.4	$148.0	0.03%	0.31%
Gillnet-sink	$271.9	$187.2	0.62%	1.95%
Handline	$15.5	$3.6	0.08%	0.27%
Pot-other	$518.8	$332.6	0.29%	2.07%
Trawl-bottom	$643.8	$482.6	0.26%	1.12%
Trawl-midwater	$190.6	$97.5	0.51%	4.15%
All other gear*	$287.8	$81.1	0.17%	3.04%
All gear types	$1,662.1	$1,428.3	0.15%	0.99%

Source: Developed using data from NMFS (2021b, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-25. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D3 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$335.5	$102.8	0.17%	0.49%
Dredge-scallop	$412.9	$152.7	0.03%	0.32%
Gillnet-sink	$282.2	$191.9	0.64%	2.00%
Handline	$15.6	$3.7	0.08%	0.27%
Pot-other	$502.1	$326.9	0.28%	2.03%
Trawl-bottom	$620.6	$463.4	0.25%	1.08%
Trawl-midwater	$182.1	$92.4	0.49%	3.93%

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
All other gear*	$272.1	$88.4	0.19%	3.32%
All gear types	$1,631.0	$1,422.2	0.15%	0.98%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-26. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC during Project Construction by Gear Type under Alternative D1+D2 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$368.1	$92.8	0.15%	0.45%
Dredge-scallop	$299.9	$127.1	0.03%	0.26%
Gillnet-sink	$248.9	$169.9	0.57%	1.77%
Handline	$14.6	$3.4	0.07%	0.24%
Pot-other	$501.8	$320.3	0.28%	1.99%
Trawl-bottom	$616.3	$464.8	0.25%	1.08%
Trawl-midwater	$188.6	$96.5	0.51%	4.11%
All other gear*	$283.3	$76.5	0.16%	2.87%
All gear types	$1,587.0	$1,351.2	0.14%	0.94%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-27. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D1+D3 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$332.4	$99.4	0.16%	0.48%
Dredge-scallop	$334.3	$131.9	0.03%	0.27%
Gillnet-sink	$259.2	$174.7	0.58%	1.82%
Handline	$14.8	$3.4	0.07%	0.25%
Pot-other	$485.1	$314.6	0.27%	1.96%
Trawl-bottom	$590.9	$445.6	0.24%	1.04%
Trawl-midwater	$180.1	$91.4	0.48%	3.89%
All other gear*	$267.6	$83.4	0.18%	3.13%
All gear types	$1,556.0	$1,344.3	0.14%	0.93%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-28. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D2+D3 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$334.4	$101.2	0.17%	0.49%
Dredge-scallop	$373.6	$143.0	0.03%	0.30%
Gillnet-sink	$263.5	$181.7	0.61%	1.89%
Handline	$15.4	$3.6	0.08%	0.26%
Pot-other	$489.7	$314.2	0.27%	1.95%
Trawl-bottom	$603.4	$453.9	0.24%	1.05%
Trawl-midwater	$180.9	$91.8	0.48%	3.91%

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
All other gear*	$271.6	$85.1	0.18%	3.19%
All gear types	$1,585.3	$1,374.5	0.14%	0.95%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-29. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative D1+D2+D3 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$331.3	$97.8	0.16%	0.47%
Dredge-scallop	$295.1	$122.1	0.02%	0.25%
Gillnet-sink	$239.5	$164.5	0.55%	1.71%
Handline	$14.5	$3.3	0.07%	0.24%
Pot-other	$472.7	$301.9	0.26%	1.88%
Trawl-bottom	$575.9	$436.1	0.23%	1.01%
Trawl-midwater	$178.9	$90.8	0.48%	3.87%
All other gear*	$267.1	$80.1	0.17%	3.00%
All gear types	$1,510.3	$1,296.6	0.14%	0.90%

Source: Developed using data from NMFS (2021b, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Alternative E

FMP Fishery

Table G-30. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative E1 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$344.9	$189.3	0.20%	2.43%
Atlantic Herring	$206.4	$83.9	0.32%	2.80%
Bluefish	$15.8	$8.0	0.63%	1.37%
Highly Migratory Species	$5.9	$1.9	0.08%	0.86%
Jonah Crab	$26.2	$15.4	0.16%	0.26%
Mackerel, Squid, and Butterfish	$236.6	$111.8	0.22%	0.72%
Monkfish	$173.3	$89.0	0.43%	1.18%
Northeast Multispecies (large-mesh)	$100.6	$42.9	0.06%	1.80%
Northeast Multispecies (small-mesh)	$124.4	$55.2	0.49%	1.95%
Sea Scallop	$373.4	$134.1	0.03%	0.27%
Skates	$131.9	$82.9	1.11%	2.32%
Spiny Dogfish	$26.2	$11.5	0.39%	4.70%
Summer Flounder, Scup, Black Sea Bass	$103.2	$65.3	0.16%	0.59%
Other FMPs, non-disclosed species and non-FMP fisheries	$356.0	$169.3	0.18%	0.50%
All FMP and non-FMP Fisheries	$1,309.5	$1,060.5	0.11%	0.74%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Table G-31. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by FMP Fishery under Alternative E2 (2008–2019)

FMP Fishery	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
American Lobster	$413.9	$225.9	0.24%	2.90%
Atlantic Herring	$218.6	$86.1	0.33%	2.87%
Bluefish	$15.1	$8.0	0.62%	1.36%
Highly Migratory Species	$6.4	$2.0	0.09%	0.90%
Jonah Crab	$29.9	$17.9	0.19%	0.31%
Mackerel, Squid, and Butterfish	$265.8	$120.7	0.23%	0.78%
Monkfish	$194.6	$99.7	0.48%	1.33%
Northeast Multispecies (large-mesh)	$103.1	$44.6	0.06%	1.87%
Northeast Multispecies (small-mesh)	$112.0	$51.2	0.45%	1.81%
Sea Scallop	$394.8	$142.9	0.03%	0.29%
Skates	$155.8	$94.9	1.27%	2.65%
Spiny Dogfish	$25.7	$11.9	0.40%	4.89%
Summer Flounder, Scup, Black Sea Bass	$113.7	$70.0	0.18%	0.64%
Other FMPs, non-disclosed species and non-FMP fisheries	$371.8	$191.5	0.20%	0.57%
All FMP and non-FMP Fisheries	$1,438.2	$1,167.3	0.12%	0.81%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Other FMPs, non-disclosed species, and non-FMP fisheries includes revenue from three FMP fisheries: Surfclam/ Ocean Quahog, Red Crab, and River Herring. In addition, it includes revenue from species in FMP fisheries for which data could not be disclosed due to confidentiality restrictions, and revenue earned by federally permitted vessels operating in fisheries that are not federally managed.

Port

Table G-32. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative E1 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$573.4	$445.1	0.97%	1.62%
New Bedford, MA	$372.5	$261.0	0.07%	0.54%
Little Compton, RI	$179.9	$107.4	5.39%	5.54%
Westport, MA	$70.1	$41.9	3.21%	3.58%
Newport, RI	$153.0	$88.5	1.00%	3.07%
Chilmark/Menemsha, MA	$19.7	$11.2	2.37%	2.66%
Fairhaven, MA	*$23.5*	*$12.2*	*0.11%*	*0.85%*
Montauk, NY	$32.4	$14.8	0.08%	0.12%
Fall River, MA	*$14.5*	*$6.9*	*0.60%*	*1.54%*
Tiverton, RI	$15.1	$5.5	0.48%	0.84%
Other Ports, MA	*$15.7*	*$7.1*	*0.01%*	*0.15%*
Point Pleasant, NJ	*$9.2*	*$2.8*	*0.01%*	*0.03%*
Newport News, VA	*$8.2*	*$2.3*	*0.01%*	*0.13%*
Beaufort, NC	*$4.0*	*$1.9*	*0.07%*	*0.22%*
Hampton, VA	*$6.3*	*$2.9*	*0.02%*	*0.19%*
Other New England/Mid-Atlantic ports*	$76.6	$38.1	0.01%	0.13%
All New England/Mid-Atlantic Ports	$1,309.5	$1,049.5	0.11%	0.73%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Table G-33. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Port under Alternative E2 (2008–2019)

Port and State	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue at Risk as a Percentage of Total Revenue in the Mid-Atlantic and New England Regions	Average Annual Revenue at Risk as a Percentage of Total Revenue in the RFA
Point Judith, RI	$589.0	$460.0	1.00%	1.67%
New Bedford, MA	$402.1	$299.6	0.08%	0.62%
Little Compton, RI	$197.6	$120.7	6.06%	6.22%
Westport, MA	$101.4	$58.8	4.51%	5.03%
Newport, RI	$166.7	$95.6	1.07%	3.32%
Chilmark/Menemsha, MA	$26.4	$15.5	3.29%	3.69%
Fairhaven, MA	*$26.7*	*$14.0*	*0.12%*	*0.97%*
Montauk, NY	$35.9	$16.0	0.09%	0.13%
Fall River, MA	*$15.7*	*$7.3*	*0.64%*	*1.64%*
Tiverton, RI	*$16.5*	*$6.1*	*0.53%*	*0.94%*
Other Ports, MA	*$15.8*	*$7.6*	*0.01%*	*0.16%*
Point Pleasant, NJ	*$13.4*	*$3.6*	*0.01%*	*0.04%*
Newport News, VA	*$11.1*	*$3.0*	*0.01%*	*0.18%*
Beaufort, NC	*$4.6*	*$2.3*	*0.09%*	*0.26%*
Hampton, VA	*$7.3*	*$3.4*	*0.02%*	*0.22%*
Other New England/Mid-Atlantic ports*	$122.2	$71.1	0.02%	0.24%
All New England/Mid-Atlantic Ports	$1,438.2	$1,184.5	0.12%	0.82%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Ports shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes unlisted ports that had landings and data from non-disclosed years from listed ports harvested by federally permitted vessels fishing along the offshore RWEC or in the Lease Area.

Gear

Table G-34. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative E1 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$189.3	$55.9	0.09%	0.27%
Dredge-scallop	$380.8	$134.8	0.03%	0.28%
Gillnet-sink	$236.5	$161.4	0.54%	1.68%
Handline	$13.7	$3.3	0.07%	0.24%
Pot-other	$357.8	$231.0	0.20%	1.44%
Trawl-bottom	$494.3	$380.3	0.20%	0.88%
Trawl-midwater	$152.4	$75.9	0.40%	3.23%
All other gear*	$184.1	$53.9	0.11%	2.02%
All gear types	$1,309.5	$1,096.4	0.11%	0.76%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Gear types shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

Table G-35. Annual Commercial Fishing Revenue Exposed in the Lease Area and along the RWEC by Gear Type under Alternative E2 (2008–2019)

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Dredge-clam	$207.3	$78.1	0.13%	0.37%
Dredge-scallop	$402.5	$143.6	0.03%	0.30%
Gillnet-sink	$264.0	$178.9	0.60%	1.86%
Handline	$15.3	$3.6	0.08%	0.26%
Pot-other	$432.2	$276.3	0.24%	1.72%

Gear Type	Peak Annual Revenue ($1,000s)	Average Annual Revenue ($1,000s)	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the Mid-Atlantic and New England Regions	Average Annual Revenue in the Lease Area as a Percentage of Total Landings in the RFA
Trawl-bottom	$541.9	$398.6	0.21%	0.93%
Trawl-midwater	$156.2	$79.5	0.42%	3.39%
All other gear*	$230.2	$54.6	0.12%	2.05%
All gear types	$1,438.2	$1,213.1	0.13%	0.84%

Source: Developed using data from NMFS (2021a, 2022).

Notes: Revenue is adjusted for inflation to 2019 dollars. Peak annual revenue is calculated independently for all rows including the total row.

Gear types shown in *italics* indicate that fewer than 12 years but more than 4 years of data were used to calculate the estimates. Otherwise, estimates are based on 12 years of data.

* Includes revenue from federally permitted vessels using longline gear, seine gear, other gillnet gear, and unspecified gear, as well as listed gear for years when they were not disclosed.

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Demographics, Employment, and Economics

This section provides a summary of the assumptions and methodologies used to generate estimates of the employment impacts of the RWF under the alternatives assessed.

Assumptions Regarding Local Hiring Practices and Local and U.S. Suppliers of Wind Farm Components

This section contains two subsections that describe a) the assumptions regarding the local hiring practices of Revolution Wind, and b) the ability of local and U.S. manufacturing industries to meet the demands of offshore wind projects.

Local Hiring Practices

Revolution Wind documents many of its assumptions relating to local hiring practices in Table ES-1 of the COP and provides additional information in Section 4.6.1 of the COP. These are summarized in the bulleted list below and provide guidance for the assessment of the economic impacts of the Project and alternatives:

- Where possible, local workers would be hired to meet labor needs for Project construction, operations and maintenance (O&M), and decommissioning.
- The onshore facilities construction schedule would be designed to minimize impacts to the local community during the summer tourist season, generally between Memorial Day and Labor Day.
- The RWF would be constructed using multiple ports for fabrication and pre-commissioning and could utilize locations in different states throughout the geographic analysis area.
- Revolution Wind would hire local workers to the extent practical for RWF, RWEC, and interconnection facility management, fabrication, and construction.
- Non-local construction personnel typically include mariners, export cable manufacturing personnel, and other specialists who may temporarily relocate during the construction and decommissioning.
- Population impacts to the communities in the geographic analysis area could result mainly from the short-term influx of construction personnel. The total population change is assumed to equal the total number of non-local construction workers plus any accompanying family members. Due to the short duration of construction activities,[6] however, it is unlikely that non-local workers would relocate families to the area.

Assumptions Regarding the Ability of "Local Suppliers" to Meet Project Demands for Specialized Project Components

Several recent studies describe the offshore wind industry in the United States as being in its early developmental stages, and that as it currently exists, a relatively large share of the capital expenditures

[6] Revolution Wind lists the expected duration of various components of construction, installation, and commissioning of the Project in Sections 3.3 and 3.4 of the COP. It is assumed that the actual construction work on the Project would be completed within a 2-year window. Final engineering, design, and manufacturing of Project components would begin prior to actual construction and installation.

(CapEx) of the Project and the resulting jobs and income for offshore wind projects are likely to leak out to economies outside both the geographic analysis area and the United States as a whole. In its study for the U.S. Department of Energy, Navigant Consulting, Inc. (2013:x) states that because of the lack of U.S. demand for offshore components, "no domestic manufacturing facilities are currently serving the offshore wind market." More recently, AECOM (2017:3-42) in its white paper, *Evaluating Benefits of Offshore Wind Energy Projects in NEPA*, developed for BOEM, states the following:

> At each phase of offshore wind energy development, there is the potential to generate economic benefits locally, regionally, nationally, and/or internationally, depending on the extent to which these geographic areas can deliver the materials and skills necessary to develop offshore wind energy. Imported materials and services into the particular region being assessed represent lost opportunities for local production and employment. As the offshore wind energy industry advances in the U.S., more opportunities for domestic value can be created along the value chain and for supporting services. Supporting services could include consulting services, financial services, education and training, and research and development.

From a more quantitative perspective, BVG Associates Limited (BVG) (2017) concludes that for offshore projects constructed before 2022, the United States as a whole can expect to realize a minimum of 35% of the total expected jobs needed to meet U.S. demand, including jobs in the supply chain, development, and construction. In addition, BVG concludes that there is high probability that United States–based jobs could be between 50% and 63% of offshore wind–related jobs by 2022.

A March 2020 report by the American Wind Energy Association (2020) appears somewhat more conservative and assumes in its baseline scenario that by 2025, U.S. offshore wind installations will reach 2,000 MW per year with domestic content reaching 21% of the total capital expenditure. By 2030 it expects domestic content to increase to 45% in its baseline scenario.

Based on the economic impact methodology used, which is described in the next section, it is estimated that the local share of CapEx for the RWF will range from approximately 20% to 30% of pre-tax CapEx, while the local share for operating expenditures (OpEx) (excluding local taxes, lease payments, and finance charges) is estimated at 40% to 50% of total OpEx (excluding local taxes, lease payments, and finance charges).

Methodology Used to Estimate Employment and Value-Added Impacts of Alternatives Included in the Environmental Impact Statement

This section describes the methodology used to generate estimates of the economic impacts (jobs and value added) of the Project and included alternatives. The first section describes the estimates of economic impacts of the Project as estimated in the COP, and the second section describes the methodology utilized to assess the impacts of permutations of the Project required for the EIS that were not included in the COP.

Economics Impacts of the Project as Estimated in the Construction and Operations Plan

In the COP and Appendix BB to the COP, Guidehouse, Inc. (Guidehouse) (2020), using the Jobs and Economic Development Impacts Offshore Wind Model (JEDI-OWM) developed by the National

Renewable Energy Laboratory (NREL 2017), provides an economic impact analysis summarizing estimates of jobs, earnings, output, and value added that are expected to result from a "baseline" project with a nameplate capacity of 712 megawatts (MW) that utilizes 89 wind turbine generators (WTGs), each with a capacity to generate 8 MW of power. In COP Appendix BB, Guidehouse states that the "primary source for the model inputs was DWW Rev I who provided capital and operating budgets including costs, employment, and percent local data that are specific to the Project." While the COP and Appendix BB summarize "baseline project" impacts, very few of the project-specific inputs provided to Guidehouse for use in its modeling exercise were actually specified. Two key confidential inputs[7] were included in Appendix BB—specifically, the total expected capital expenditures (Total CapEx) for the Project and the total local expenditure for O&M (Local OpEx). Table G-36 summarizes the "local" jobs and investment impacts of the baseline project in Rhode Island and Connecticut as estimated by Guidehouse.

Table G-36. Summary of Jobs and Investment Impacts in Rhode Island and Connecticut for the Baseline Project

Project Phase	Impact Category	Jobs	Earnings ($ millions)	Output ($ millions)	Value Added ($ millions)
Construction	Direct	1,440	$124.40	$148.80	$130.10
	Indirect	1,623	$123.00	$497.40	$205.80
	Induced	793	$51.10	$137.60	$81.10
	Total	**3,856**	**$298.50**	**$783.90**	**$417.00**
Operations	Direct	58	$4.90	$4.90	$4.90
	Indirect	18	$1.50	$51.40	$47.50
	Induced	156	$10.80	$29.30	$17.60
	Total	**233**	**$17.20**	**$85.70**	**$70.00**

Source: Guidehouse (2021)

Note that the impacts of the baseline project (712-MW capacity utilizing eighty-nine 8-MW WTGs) during construction summarize impacts over the entire construction period. Construction job figures are in job years, which are full-time equivalent (FTE) jobs multiplied by the number of construction years. Operations jobs are FTEs for a period of 1 year.

Northern Economics—the contracted economic analysts for this EIS—have developed similar estimates using the same JEDI-OWM for an identically sized project using confidential inputs for Total CapEx and Total Local OpEx that were documented in Appendix BB, but without the additional inputs that were supplied to Guidehouse from Revolution Wind. These results are provided in Table G-37 while Table G-38 presents a percentage-based comparison of the two set of results. An examination of the tables indicates that there are differences in the two sets of tables—the additional inputs supplied by Revolution Wind to Guidehouse are important for directly estimating Project impacts.

[7] These key inputs are considered confidential and therefore cannot be specified in the EIS.

Table G-37. Summary of Jobs and Investment Impacts in Rhode Island and Connecticut for the Baseline Project as Developed by Northern Economics

Project Phase	Impact Category	Jobs	Earnings ($ millions)	Output ($ millions)	Value Added ($ millions)
Construction	Direct	1,185	$56.52	$222.28	$84.95
	Indirect	2,016	$146.37	$574.85	$224.00
	Induced	1,376	$86.84	$237.76	$145.13
	Total	**4,577**	**$289.73**	**$1,034.89**	**$454.09**
Operations	Direct	42	$4.32	$4.32	$4.32
	Indirect	222	$17.06	$59.12	$25.50
	Induced	81	$5.43	$15.30	$8.25
	Total	**345**	**$26.81**	**$78.73**	**$38.07**

Source: Developed by Northern Economics using information in COP Appendix BB.

Note that the impacts of the baseline project (712-MW capacity utilizing eighty-nine 8-MW WTGs) during construction summarize impacts over the entire construction period. Construction job figures are in job years, which are full-time equivalent (FTE) jobs multiplied by the number of construction years. Operations jobs are FTEs for a period of 1 year.

Table G-38. Percentage-Based Comparison of Jobs and Economic Development Impacts Offshore Wind Model Results

Project Phase	Impact Category	Jobs in Table G-37 as a Percentage of Jobs in Table G-36 (%)	Earnings in Table G-37 as a Percentage of Earnings in Table G-36 (%)	Output in Table G-37 as a Percentage of Output in Table G-36 (%)	Value Added in Table G-37 as a Percentage of Value Added in Table G-36 (%)
Construction	Direct	82%	45%	149%	65%
	Indirect	124%	119%	116%	109%
	Induced	174%	170%	173%	179%
	Total	**119%**	**97%**	**132%**	**109%**
Operations	Direct	71%	88%	88%	88%
	Indirect	1211%	1137%	115%	54%
	Induced	52%	50%	52%	47%
	Total	**148%**	**156%**	**92%**	**54%**

Source: Developed by Northern Economics.

Notwithstanding differences in the two sets of results, the full analysis of the economic impacts of the RWF requires estimates for the baseline project as well as estimates of economic impacts for the project if larger WTGs are used (i.e., 10-MW or 12-MW WTGs), and/or if the project capacity increased to its maximum capacity of 880 MW. In addition, because there is a suite of alternatives that could constrain the number of WTG positions that can be utilized (i.e., Alternatives C, D, and E) it will be necessary to estimate economic impacts under a much wider range of Project configurations than the single configuration provided in the COP.

Therefore, a methodology that builds on the results developed by Guidehouse but allows the flexibility to estimate impacts under different configurations is required. This methodology is summarized below.

Methodology to Estimate Project Permutations while Incorporating Information from Guidehouse

The methodology developed to estimate project permutations relies on the fact that the JEDI-OWM is essentially a scalable model—if the number of WTGs increases relative to baseline and all other project inputs are held constant, then the economic impacts generally change proportionally regardless of the starting values.

Assume for example that rather than the baseline project of 712 MW utilizing eighty-nine 8-MW WTGs, a larger project of 800 MW utilizing one-hundred 8-MW turbines is assessed. In this case, the only change is the number of WTGs used in the project, which increase by 12.4% from 89 to 100. The WTGs used are assumed to have the same unit cost as the monopile foundations on which they are installed. Similarly, assuming the spacing of the WTGs remains constant, the total length of the inter-array cable would also be expected to increase by amount that approaches 12.4%. Table G-39 shows the percentage differences between the 800-MW project and the 712 MW project as estimated by Northern Economics. Based on the built-in scalability of the JEDI-OWM model, it assumed that if Guidehouse were to run the same comparison, changing only the total project capacity by changing the number of WTGs and holding all other factors constant, the results would be remarkably similar as those shown below.

Table G-39. Percentage-Based Comparison of Northern Economics JEDI-OWM Model Results between an 800-MW Project and a 712-MW Project

Project Phase	Impact Category	Jobs with the 800-MW Project as a Percentage of Jobs in Table G-3 (%)	Earnings with the 800-MW Project as a Percentage of Earnings in Table G-3 (%)	Output with the 800-MW Project as a Percentage of Output in Table G-3 (%)	Value Added with the 800-MW Project as a Percentage of Value Added in Table G-3 (%)
Construction	Direct	110.8%	109.0%	106.6%	108.4%
	Indirect	109.8%	110.3%	110.9%	110.3%
	Induced	111.0%	111.2%	111.1%	111.1%
	Total	**110.4%**	**110.3%**	**110.0%**	**110.2%**
Operations	Direct	112.4%	112.4%	112.4%	112.4%
	Indirect	112.4%	112.4%	112.4%	112.4%
	Induced	112.4%	112.4%	112.4%	112.4%
	Total	**112.4%**	**112.4%**	**112.4%**	**112.4%**

Based on the results above, economic impacts of project permutations will be estimated using the following steps:

1. Estimate the economic impacts of the project permutation by making appropriate changes to Northern Economics' baseline project inputs
2. Estimate the percentage change of the permutation against the Northern Economic baseline project impacts.
3. Apply this percentage change to the baseline project impacts estimated by Guidehouse.

Other Assumptions Used to Estimate Impacts of Project Permutations

In addition to the scaling methodology described above, the following assumptions are also utilized in the estimates of economic impacts.

Assumptions Regarding the Minimum Project Size If Larger Capacity Wind Turbine Generators are Utilized

Guidehouse does not explicitly state why it assumed a 712-MW project as opposed to a 704-MW project, which would match the Project's existing power purchase agreement (PPA) and the minimum project listed in the project design envelope (PDE), as reported in Appendix D. Note that a 712-MW project with eighty-nine 8-MW WTGs exceeds the PPA by one full 8-MW WTG. Therefore, it is assumed that excess capacity will be built by an amount equal to one WTG in excess of the number of WTGs nominally needed to meet the 704-MW PPA. Thus, if 10-MW WTGs are used, 71 WTGs (with a total capacity of 710 MW) would nominally be able meet the 704 PPA. It is assumed however that one additional WTG would be installed for a total of 720 MW—the extra WTG will provide greater reliability for customers of the project. Similarly, if 12-MW WTGs are utilized, 63 WTGs would nominally meet the PPA capacity with 708 MW. Adding one additional WTG (64 in total) will result in a project capacity of 720 MW and provide greater reliability.[8]

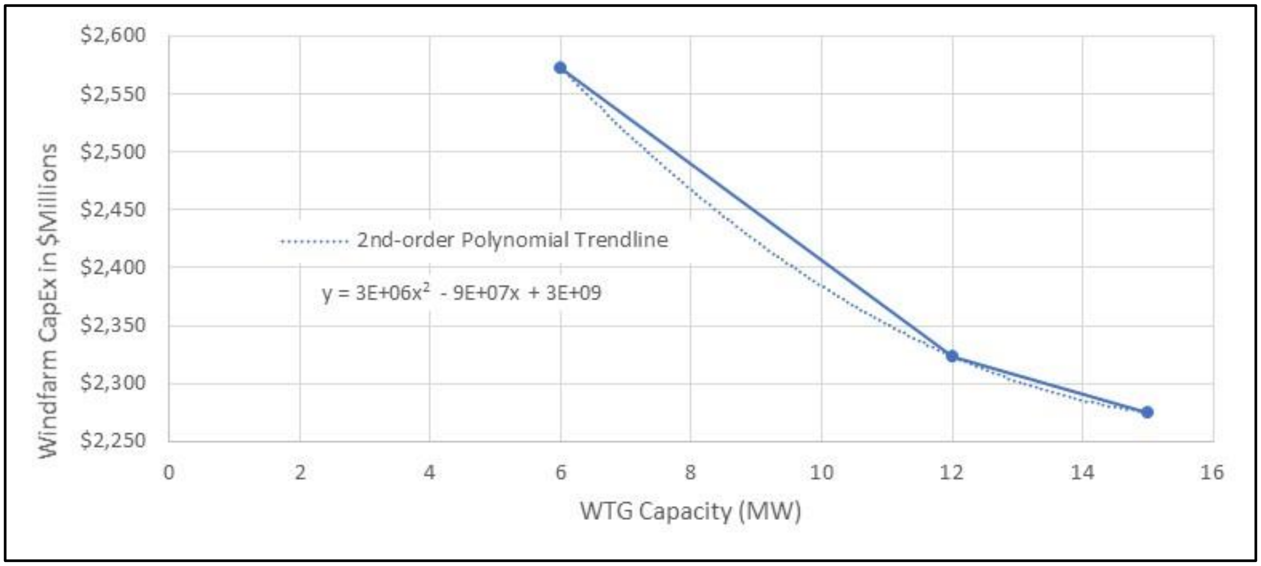
Assumptions Regarding the Relative Project Capital Costs when Higher Capacity Wind Turbine Generators Are Utilized

Information regarding the comparative capital costs of offshore wind projects that utilize smaller or larger WTGs are not readily available, although it is generally assumed and reported that utilization of larger WTGs generally results in lower overall capital costs and greater overall project efficiency. An updated version of the JEDI-OWM (Release 2021-2) has been made available (NREL 2021), which enables users to estimate project capital cost using a choice of three WTG capacities: 6 MW, 12 MW, or 15 MW.[9] Figure G-15 shows hypothetical capital cost of a 720-MW project with three alternative assumptions regarding the size of the WTGs. Moving from utilization of 6-MW WTGs to utilization of 12-MW WTGs results in a nominal CapEx reduction of approximately $250 million or 10% of total CapEx. Using 15-MW WTGs rather than 12-MW results in a smaller (2%) CapEx reduction. The 2nd order polynomial

[8] The Project developer has confirmed that the assumption is reasonable.

[9] While JEDI-OWM Release 2021-2 includes this built-in capital cost comparison feature, the model does not yet appear to include built-in local economic impact coefficients linked to multipliers that enable the user to generate economic impacts in terms of jobs, earnings, and value added.

trendline shown in the figure was used to estimates of CapEx savings for similar size projects using different sizes of WTGs ranging from 6 MW to 16 MW.



Source: Developed by Northern Economics using JEDI-OWM Release 2021-2 (NREL 2021) and the RWF Project location.

Note: Reviewers should not assume the project capital costs shown here reflect actual estimates of the project capital costs for Revolution Wind.

Figure G-15. Hypothetical Capital Cost Estimates of a 720 MW Wind Farm with Three WTG Sizes

Assumptions Regarding the Maximum Capacity Limits

The PDE summarized in Appendix D states that the maximum capacity of the Project is 880 MW. The PDE also indicates that WTGs ranging from 8 MW to 12 MW will be considered, but no more than 100 WTGs would be utilized. If one hundred 8-MW WTGs are utilized, then the largest project that could be built is 800 MW. An 880-MW project could be built using eighty-eight 10-MW WTGs, but if 12-MW WTGs are used, then seventy-three WTGs achieves a project capacity of 876 MW; utilizing seventy-four 12-MW WTGs results in a project that exceeds the maximum project capacity by 8 MW (i.e., project capacity would be 888 MW, and thus would not be developed).

Based on guidance from Revolution Wind (Roll 2021) indicating that they would not exceed the 880 MW maximum capacity of the project established in the PDE, it is presumed that the maximum project size that would be developed if 12-MW WTGs are used would comprise 73-WTGs with a total capacity of 876 MW. Similarly, if 14-MW WTGs are authorized as in Alternative F, the largest project that would be developed would utilize 62 14-MW WTGs for a total capacity of 868 MW, noting that adding an additional 14-MW turbine results in 882 MW of total capacity project which would exceed the 880 MW maximum capacity limit in the PDE.

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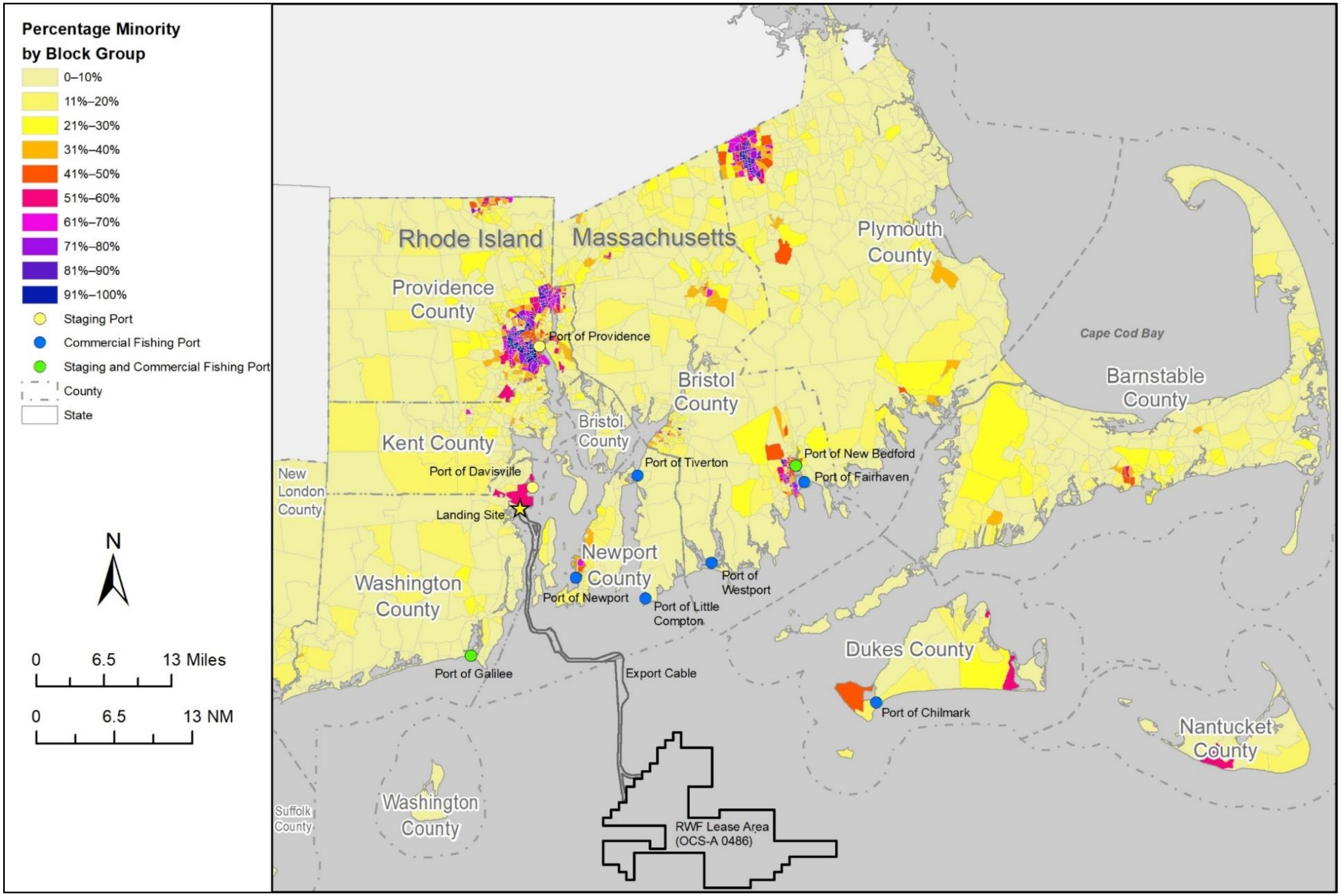
Environmental Justice

This section provides maps displaying the environmental justice characteristics of the counties and cities/towns in the geographical analysis area. The geographical analysis area includes counties that contain or are adjacent to ports that may be used for Project construction staging, O&M, or decommissioning; contain major ports that commercial fisheries that could be affected by the Project; that contain the proposed Project landing site and onshore transmission cable; or for which some portion of the county lies within the visual study area. Minority and low-income percentages are based on 2015-2019 American Community Survey 5-year summary file data obtained from EPA's EJScreen, an environmental justice screening and mapping tool (EPA 2021).

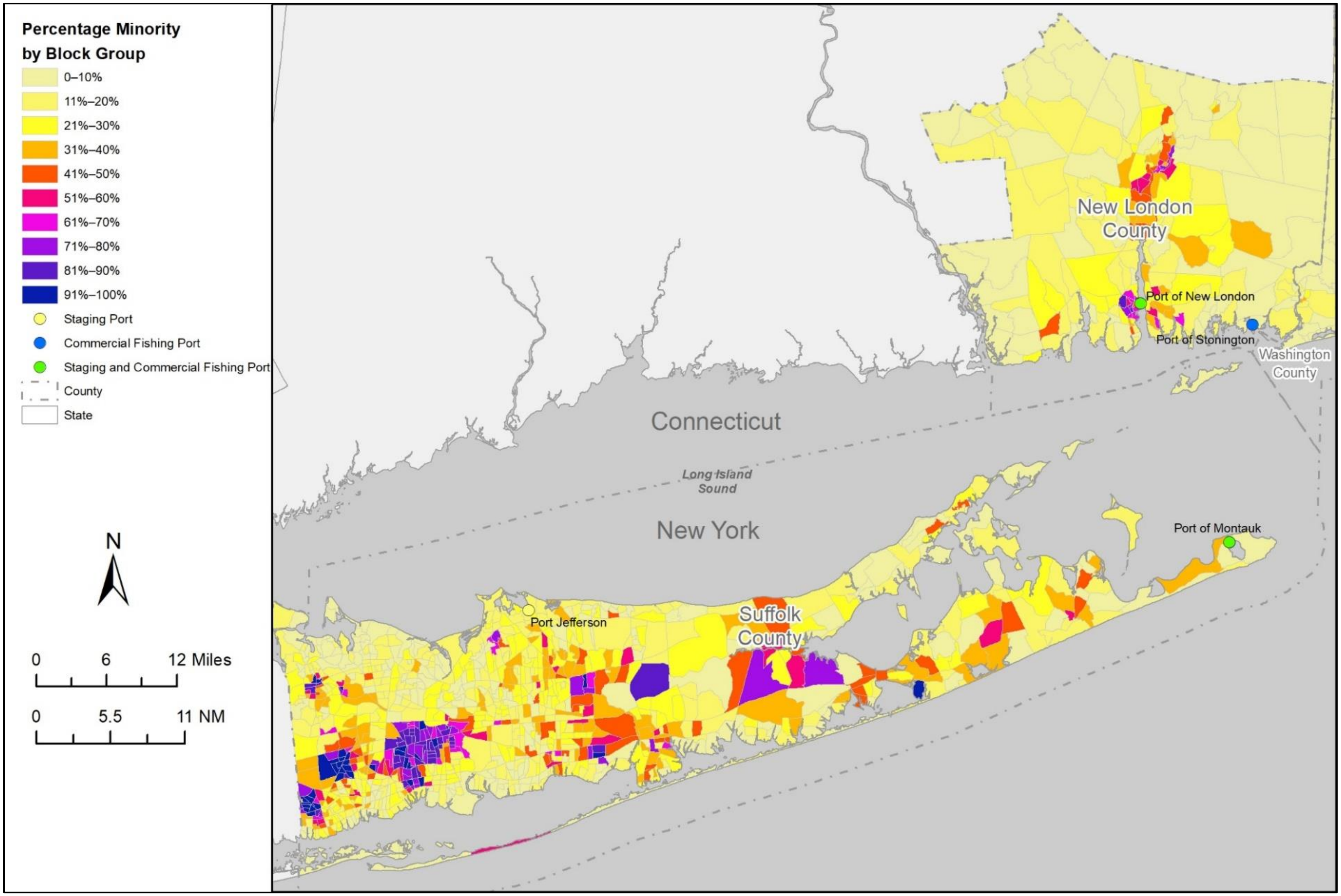
Figures G-16 though G-21 show minority population percentages by census block group, while Figures G-22 through G-27 show low-income population percentages by census block group. Figures G-28 though G-33 show the locations of block groups that have been determined to be potential environmental justice areas of concern because of concentrations of minority or low-income populations (see Section 3.12.1 for additional details).

Tables G-EJ1 through G-EJ26 provide additional information about the identity of the block groups determined to be potential environmental justice areas of concern. The tables list the multi-digit identifier of each of these block groups. The block group identifiers are organized by county and sub-county name (city, town, or census designated place). Each identifier listed in the tables include the census tract (CT) code and census block group (BG) code as reported by the U.S. Census Bureau in the online mapping tool available at https://tigerweb.geo.census.gov/tigerweb/ (U.S. Census Bureau 2021). The fully specified identifiers for census block groups include the two-digit code for the state and three-digit code for the county. The captions for the tables include these codes. Each block group is categorized based on whether it is a potential environmental justice concern because of its minority population, low-income population, or both.



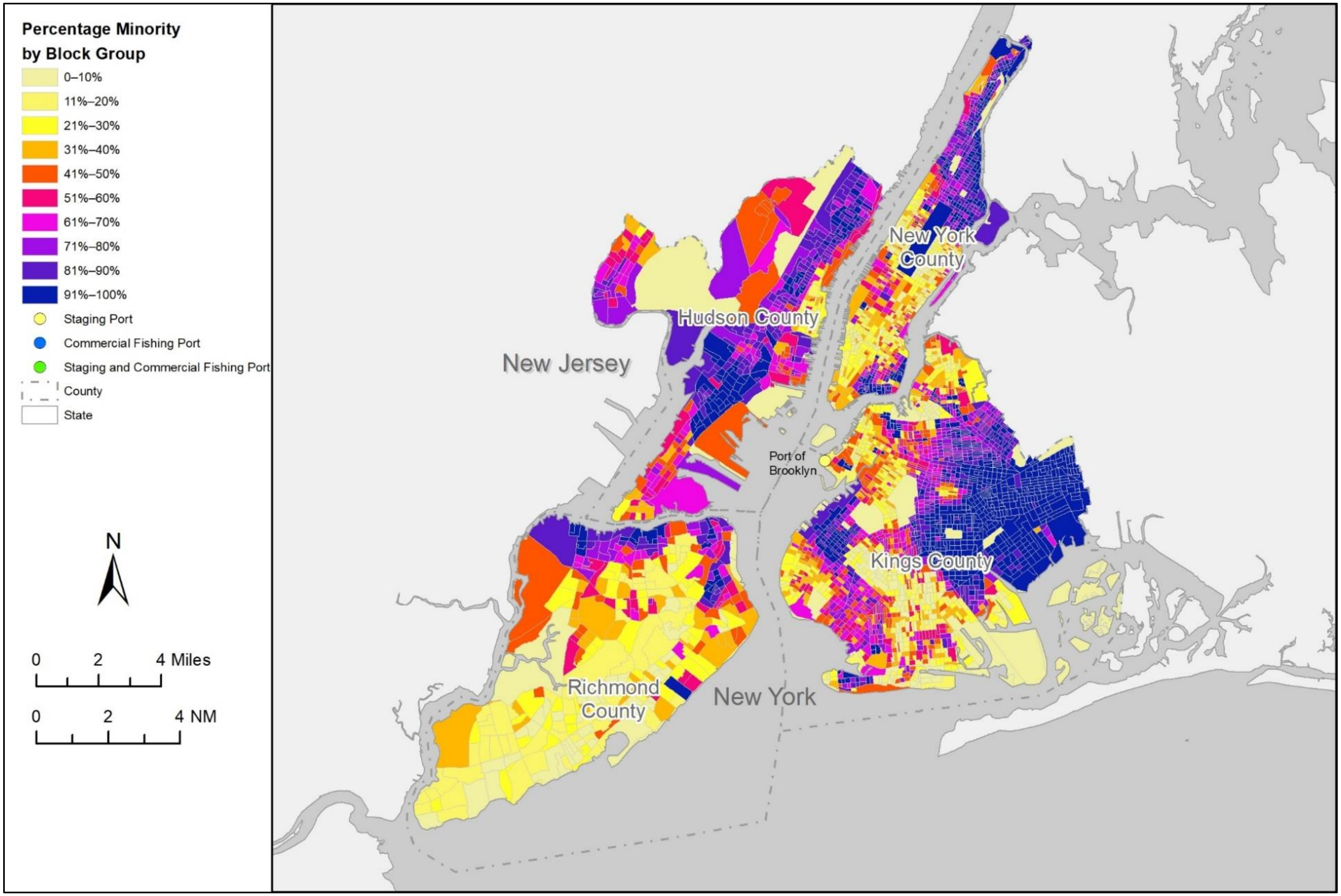
Source: Developed from information in EPA (2021).

Figure G-16. Distribution of minority populations by census block group in potentially affected counties in Rhode Island and Massachusetts.



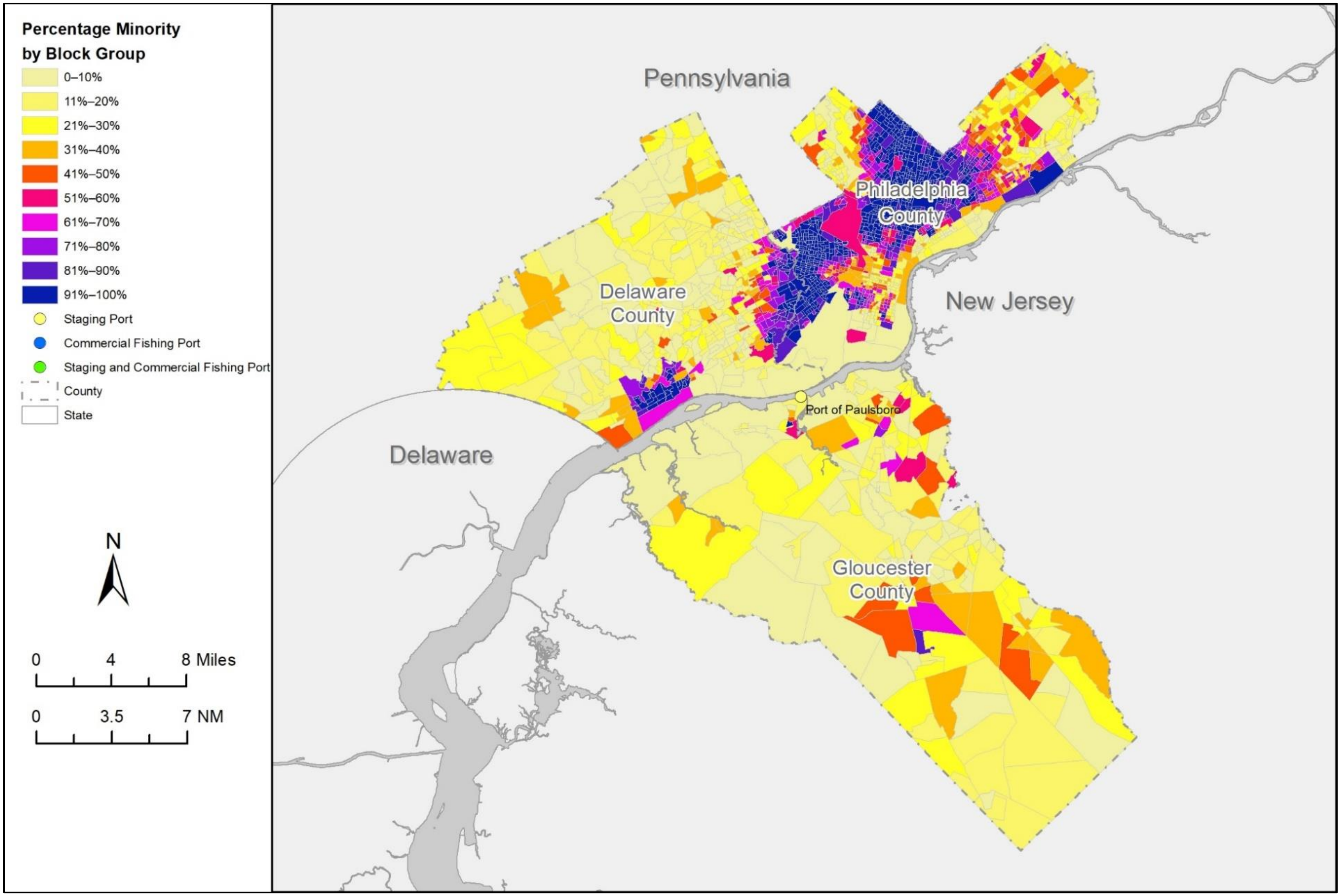
Source: Developed from information in EPA (2021).

Figure G-17. Distribution of minority populations by census block group in New London County, Connecticut, and Suffolk County, New York.



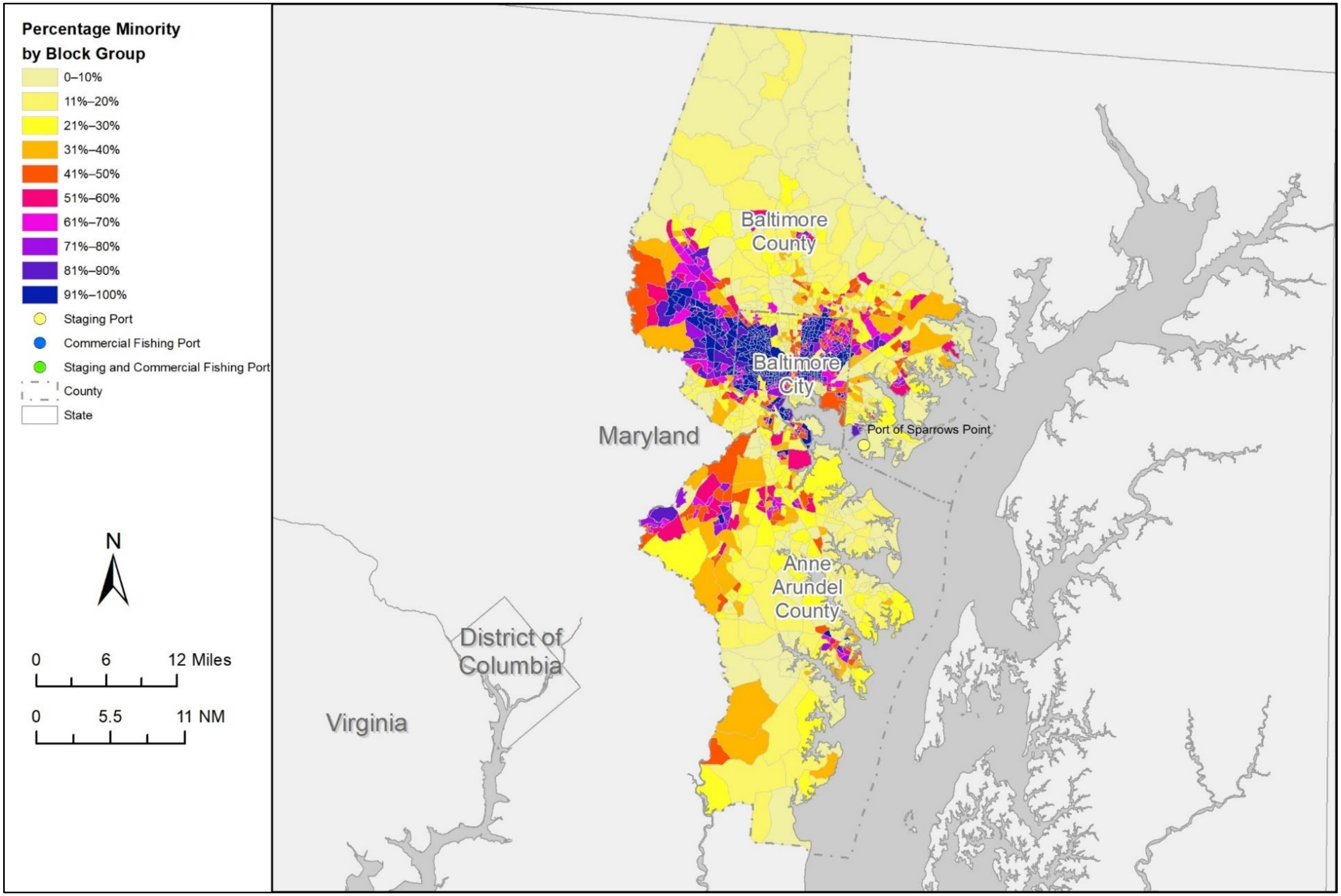
Source: Developed from information in EPA (2021).

Figure G-18. Distribution of minority populations by census block group in Kings County (Brooklyn), New York; Richmond County, New York; New York County, New York; and Hudson County, New Jersey.



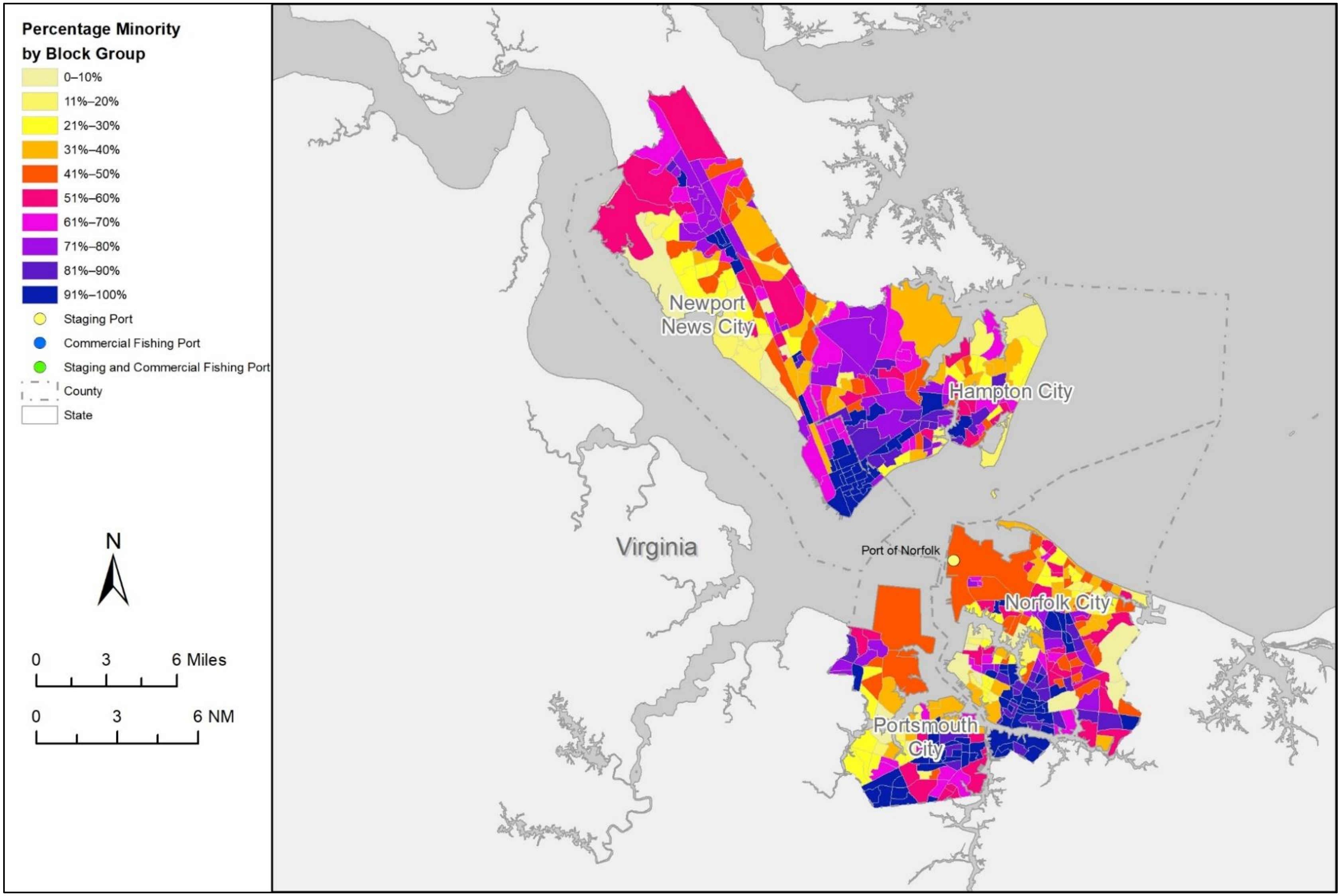
Source: Developed from information in EPA (2021).

Figure G-19. Distribution of minority populations by census block group in Gloucester County, New Jersey; Philadelphia County, Pennsylvania; and Delaware County, Pennsylvania.



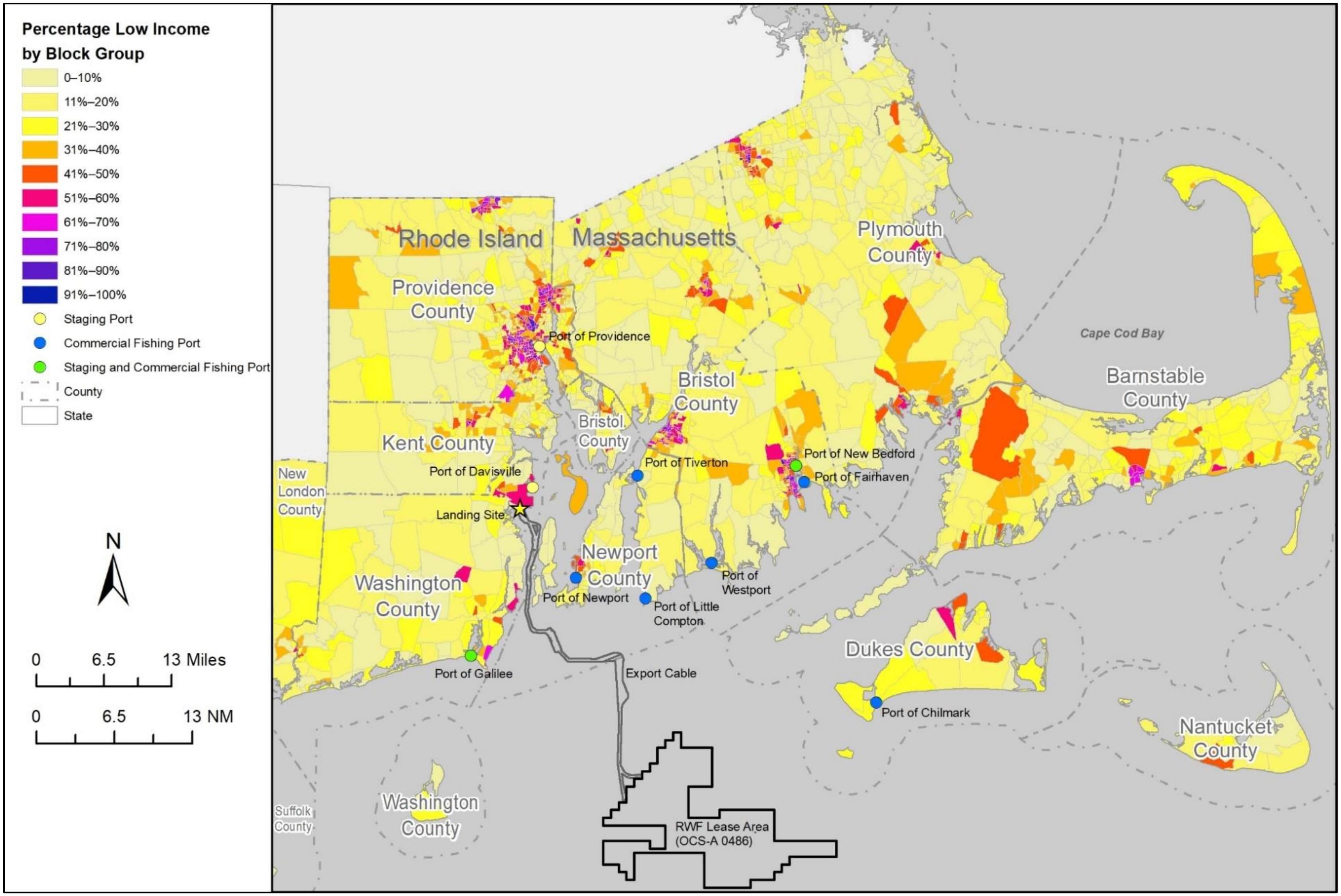
Source: Developed from information in EPA (2021).

Figure G-20. Distribution of minority populations by census block group in Baltimore County, Baltimore City, and Anne Arundel County, Maryland.



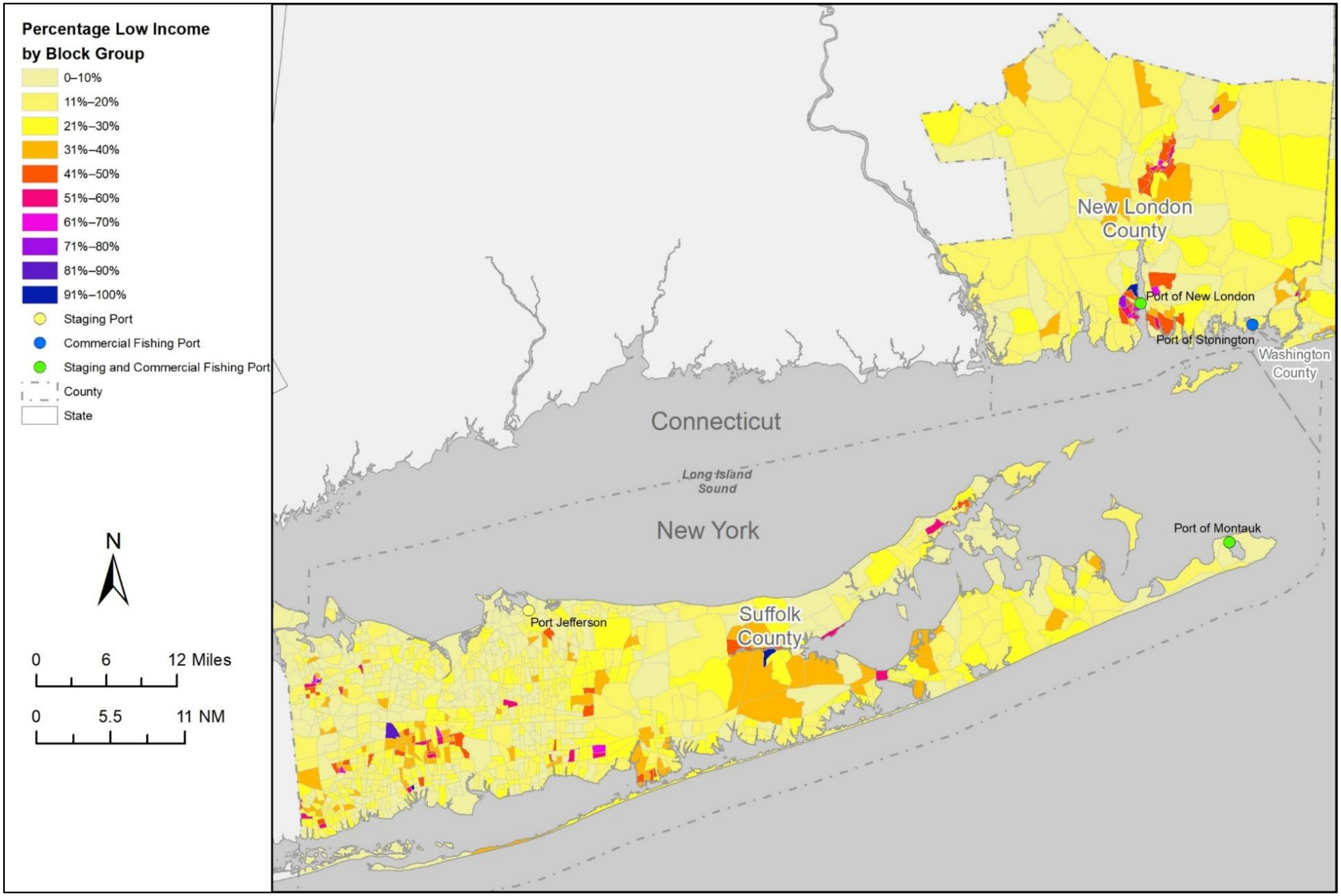
Source: Developed from information in EPA (2021).

Figure G-21. Distribution of minority populations by census block group in the cities of Norfolk, Portsmouth, Newport News, and Hampton, Virginia.



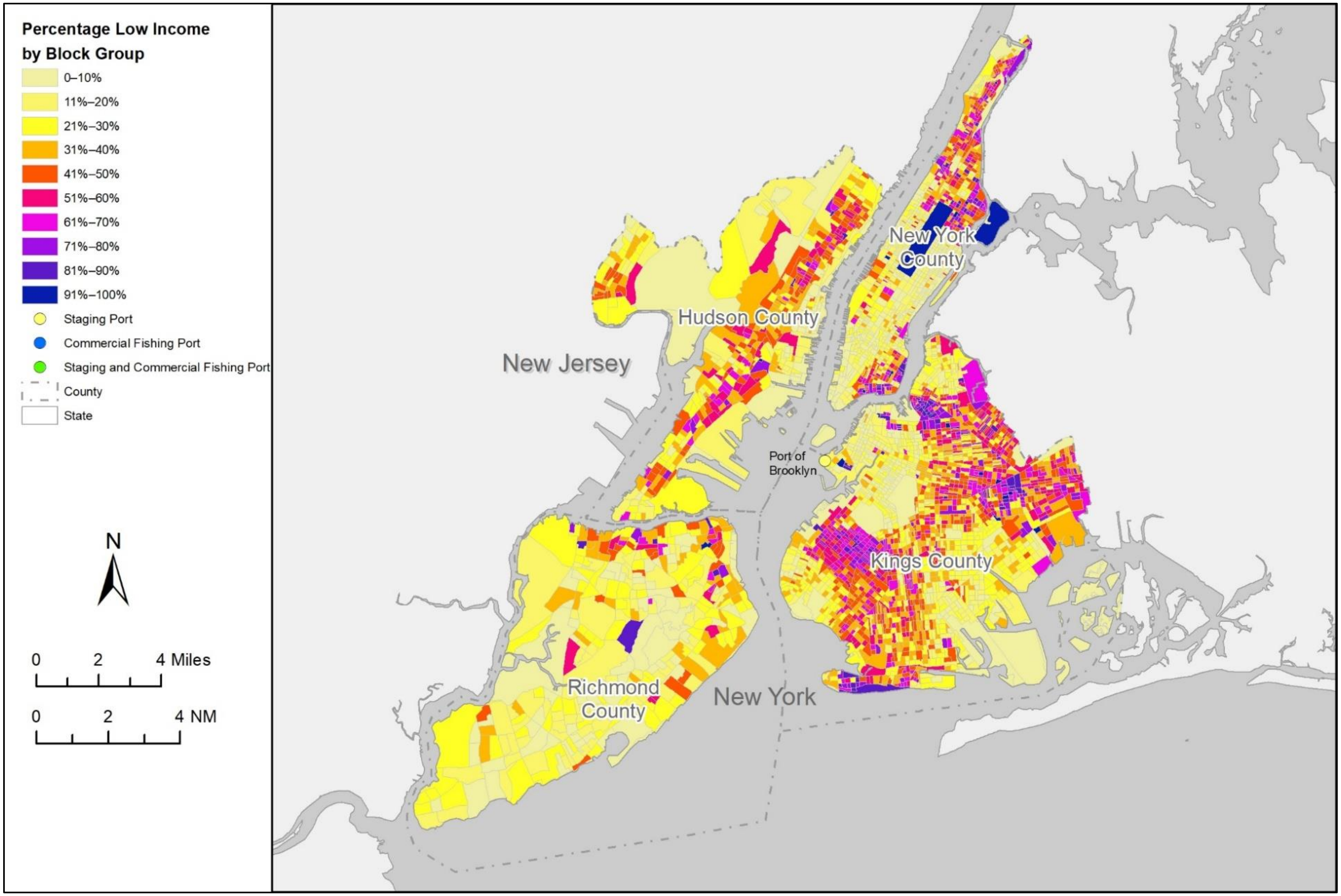
Source: Developed from information in EPA (2021).

Figure G-22. Distribution of low-income populations by census block group in potentially affected counties in Rhode Island and Massachusetts.



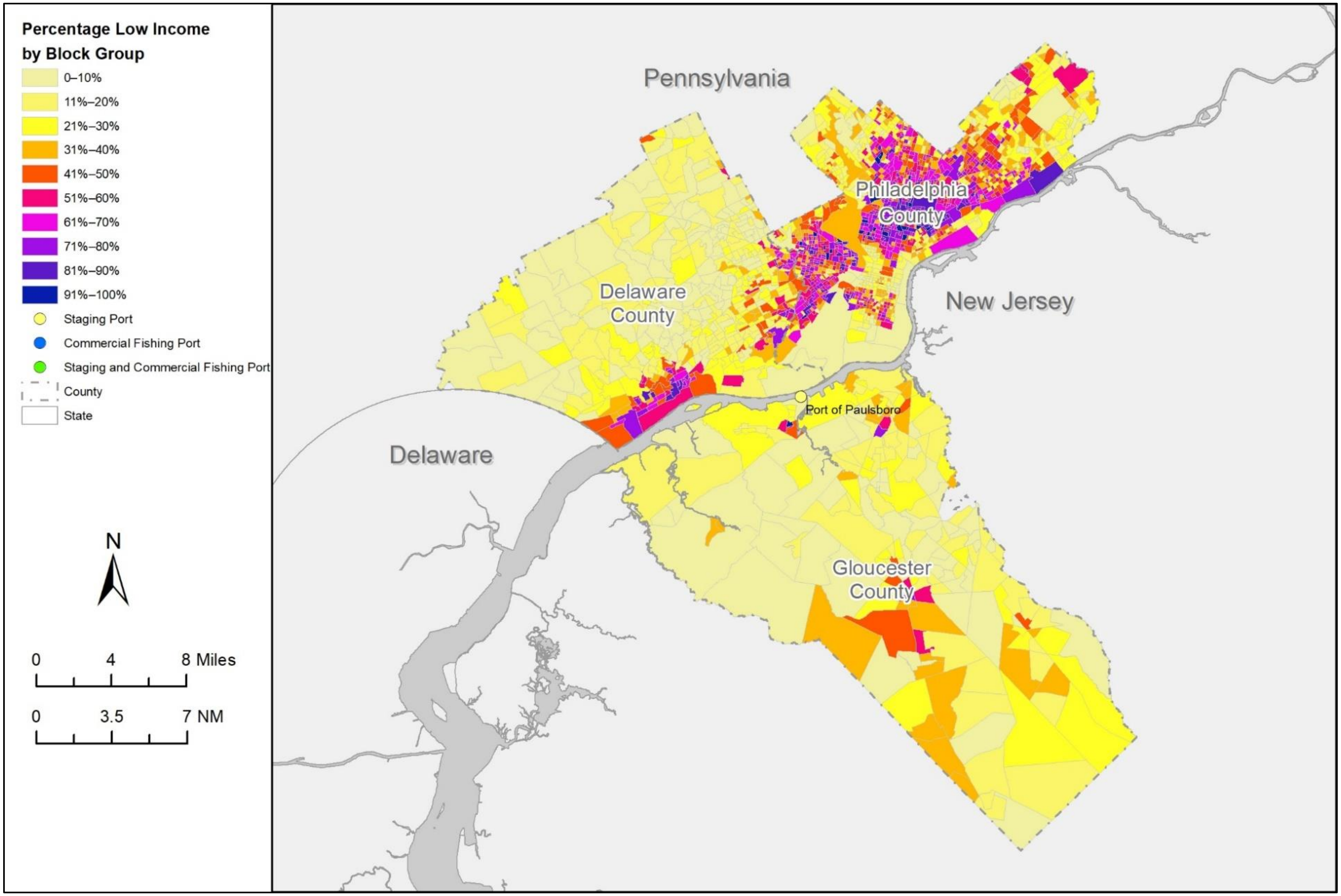
Source: Developed from information in EPA (2021).

Figure G-23. Distribution of low-income populations by census block group in New London County, Connecticut and Suffolk County, New York.



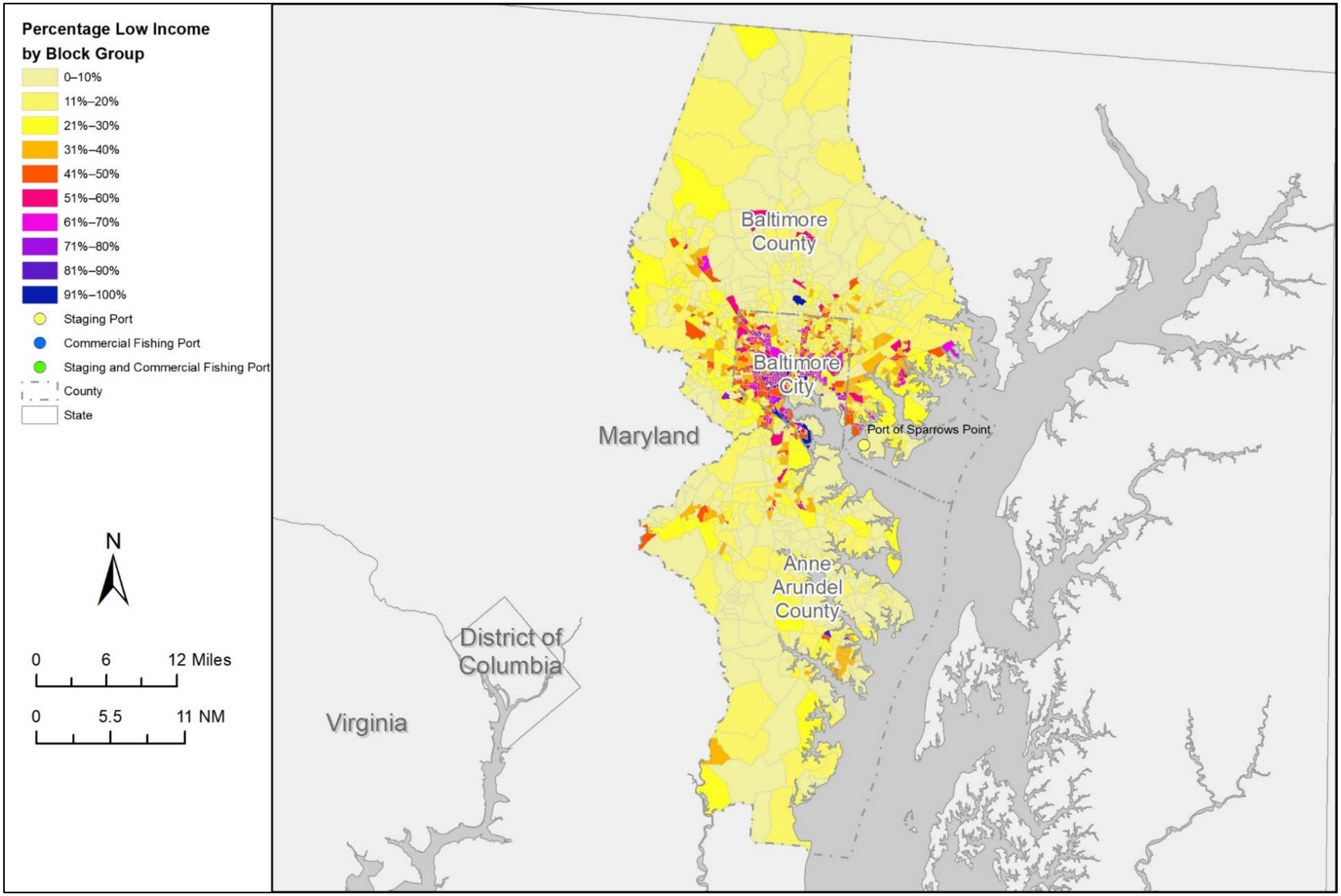
Source: Developed from information in EPA (2021).

Figure G-24. Distribution of low-income populations by census block group in Kings County (Brooklyn), New York; Richmond County, New York; New York County, New York; and Hudson County, New Jersey.



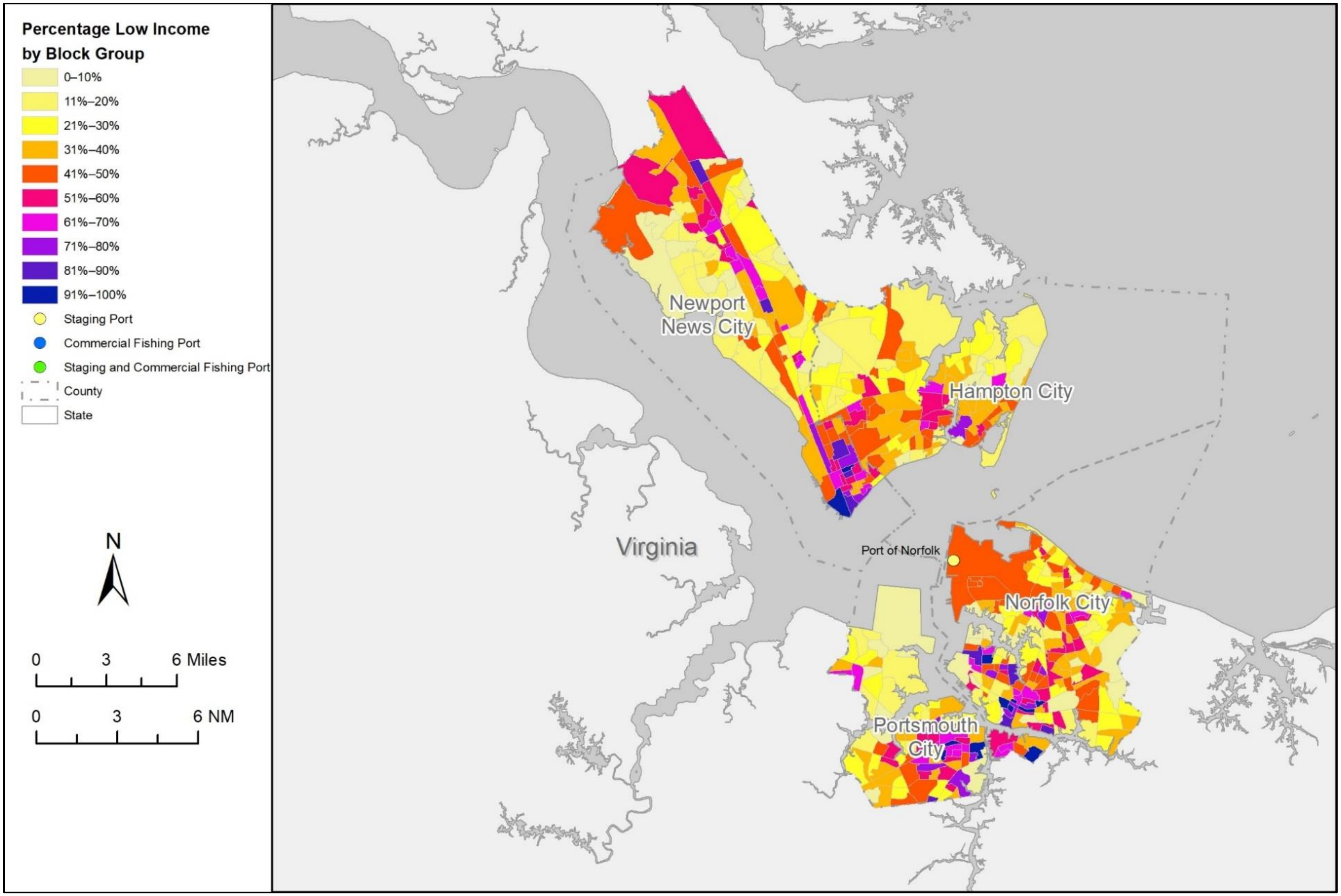
Source: Developed from information in EPA (2021).

Figure G-25. Distribution of low-income populations by census block group in Gloucester County, New Jersey; Philadelphia County, Pennsylvania; and Delaware County, Pennsylvania.



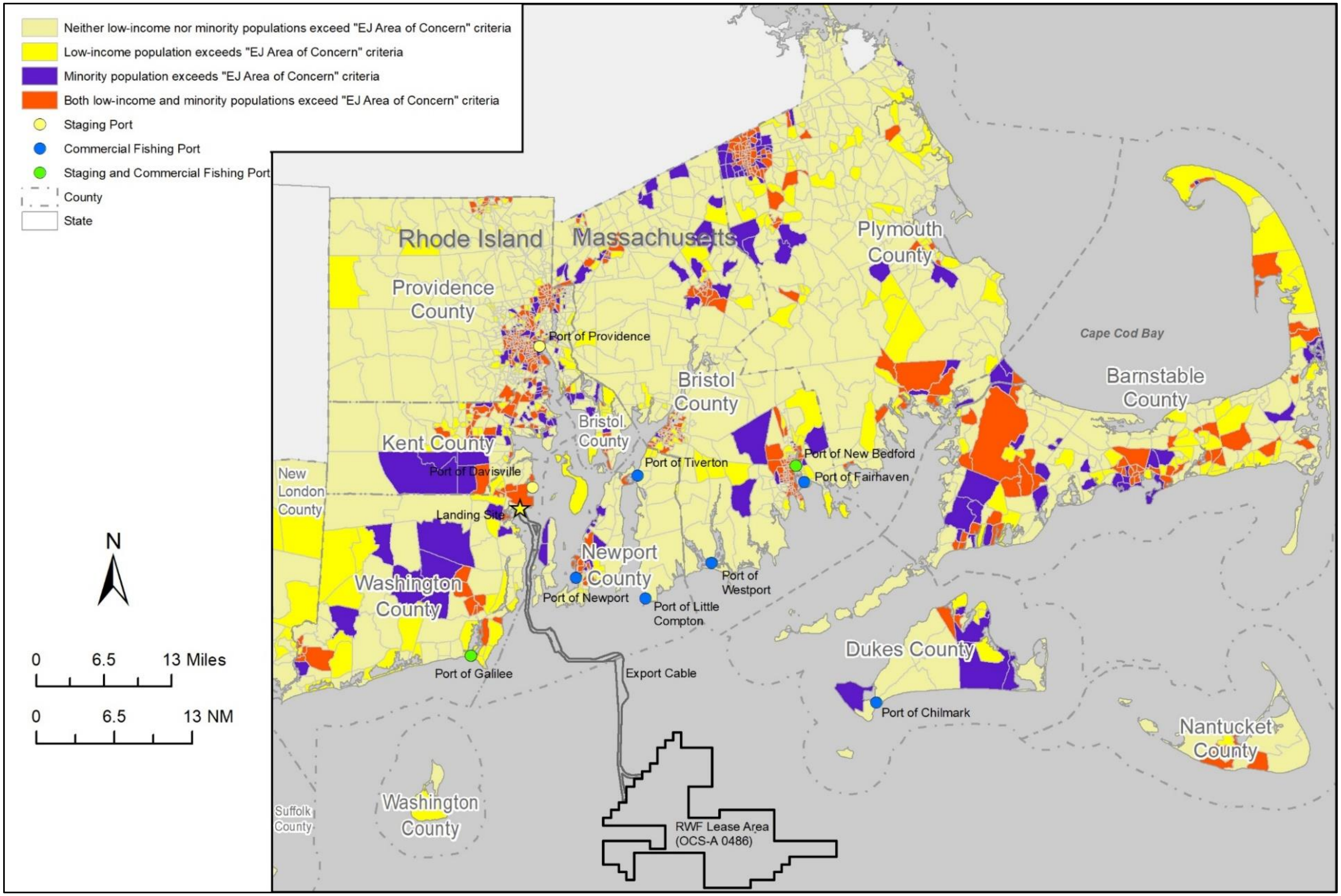
Source: Developed from information in EPA (2021).

Figure G-26. Distribution of low-income populations by census block group in Baltimore County, Baltimore City, and Anne Arundel County, Maryland.



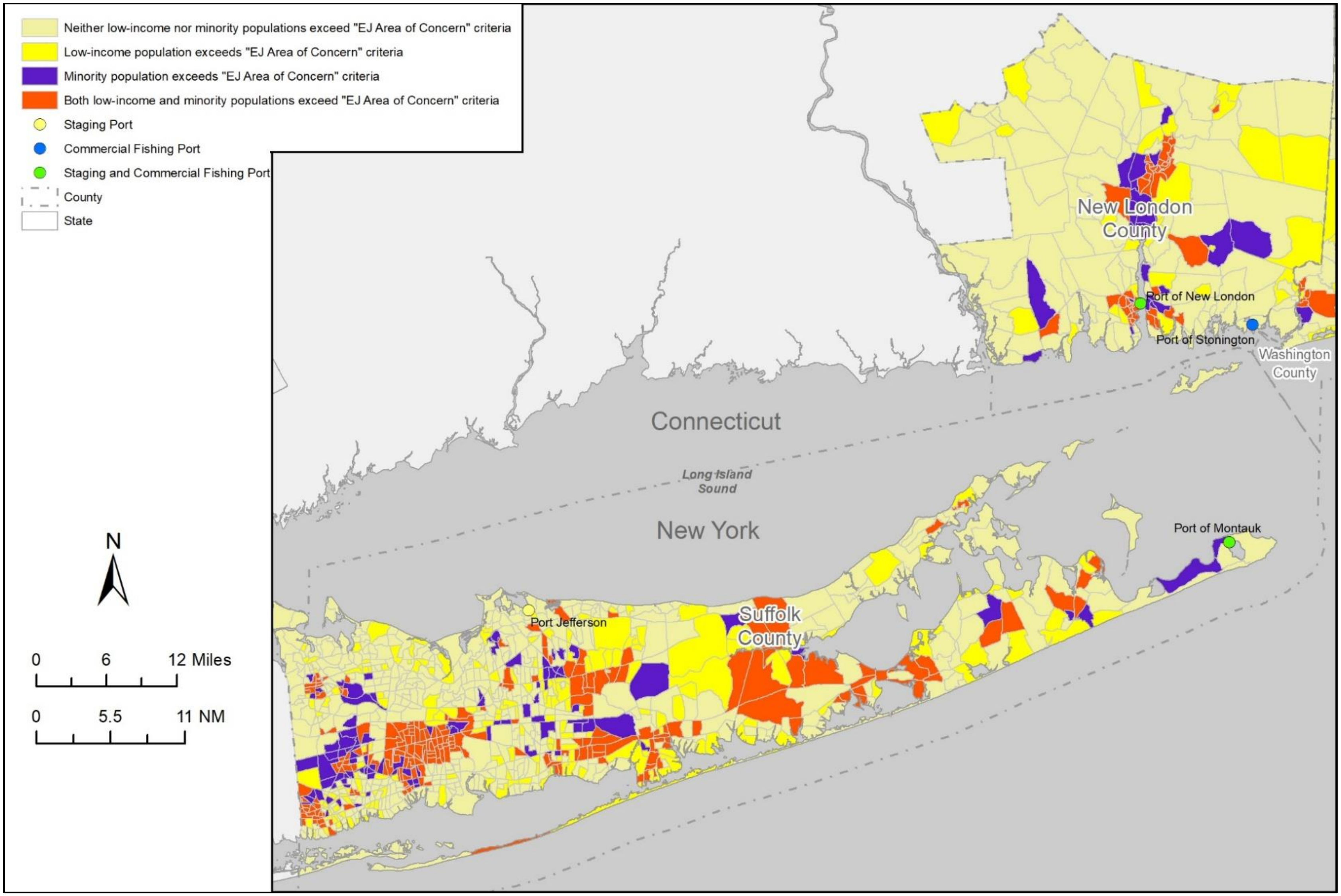
Source: Developed from information in EPA (2021).

Figure G-27. Distribution of low-income populations by census block group in the cities of Norfolk, Portsmouth, Newport News, and Hampton, Virginia.



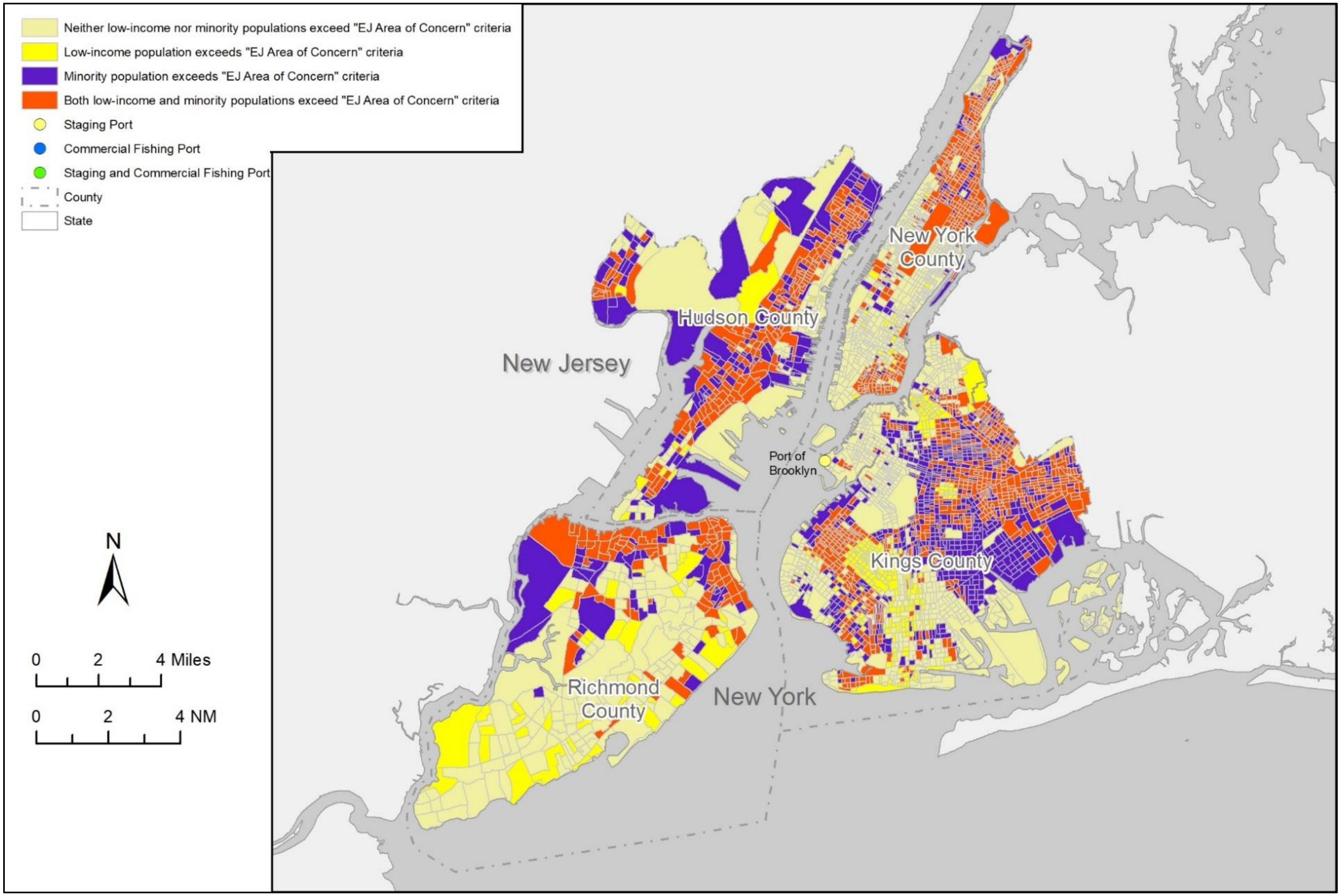
Source: Developed from information in EPA (2021).

Figure G-28. Census block groups that are potential environmental justice areas of concern in Rhode Island and Massachusetts.



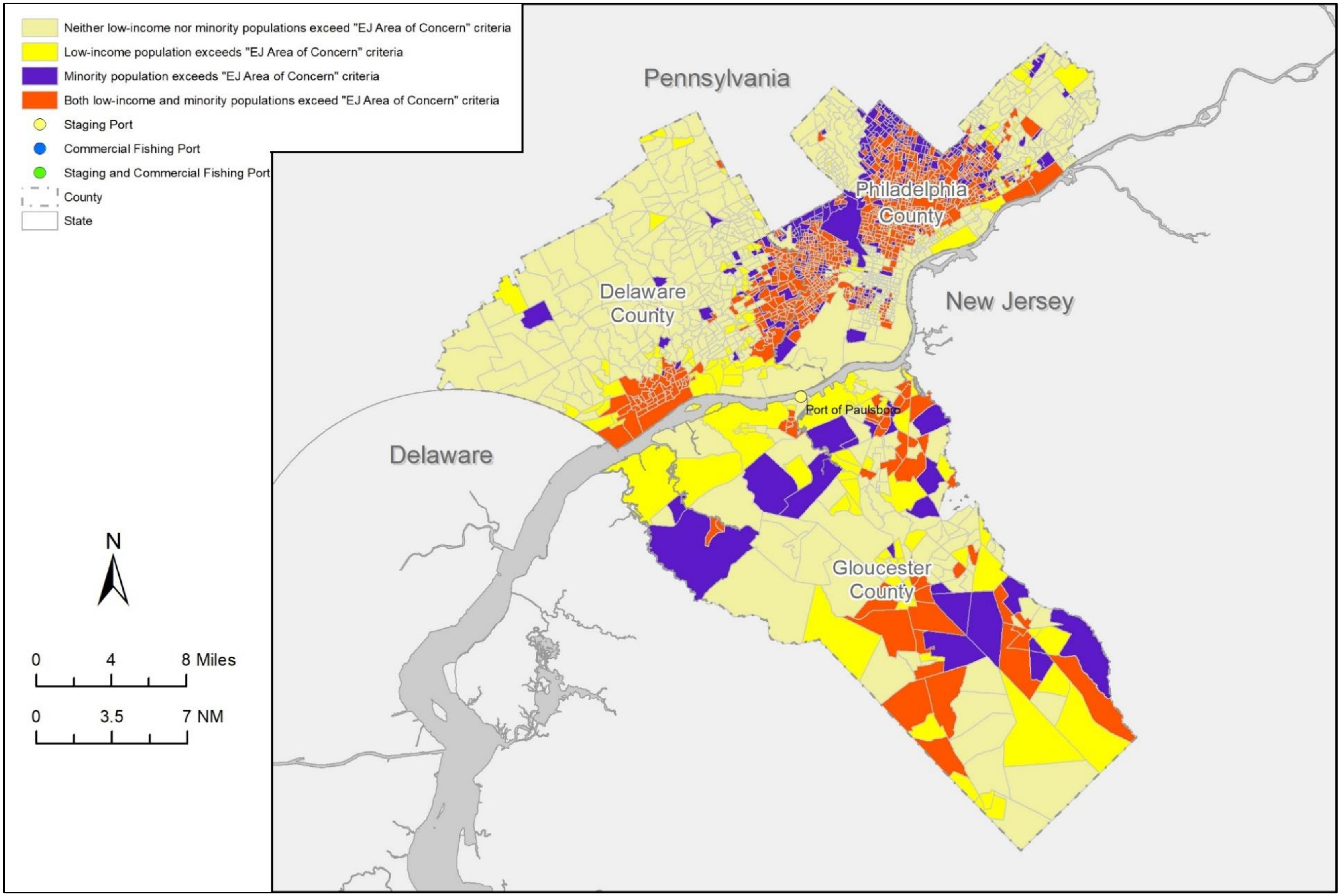
Source: Developed from information in EPA (2021).

Figure G-29. Census block groups that are potential environmental justice areas of concern in New London County, Connecticut and Suffolk County, New York.



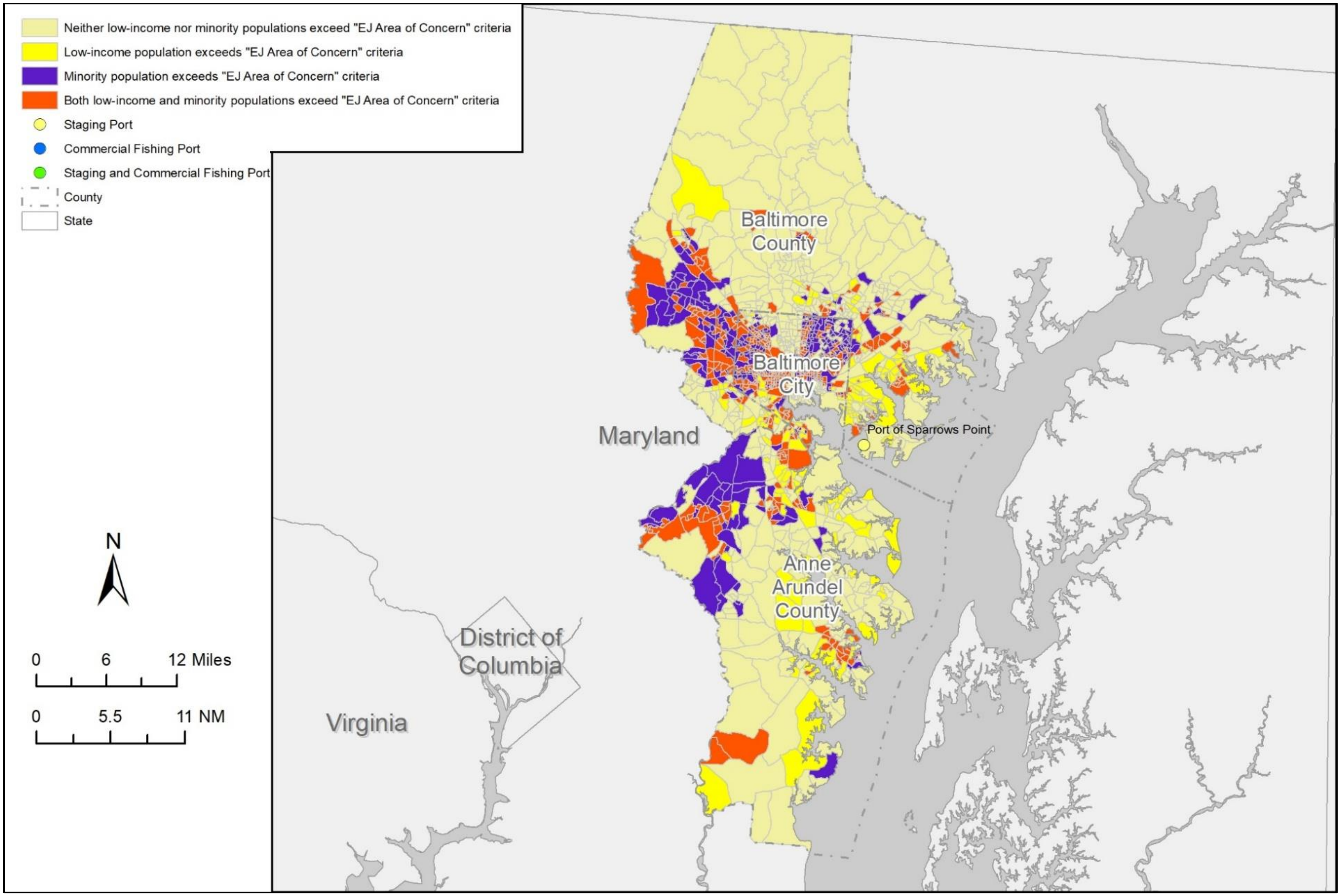
Source: Developed from information in EPA (2021).

Figure G-30. Census block groups that are potential environmental justice areas of concern in Kings County (Brooklyn), New York; Richmond County, New York; New York County, New York; and Hudson County, New Jersey.



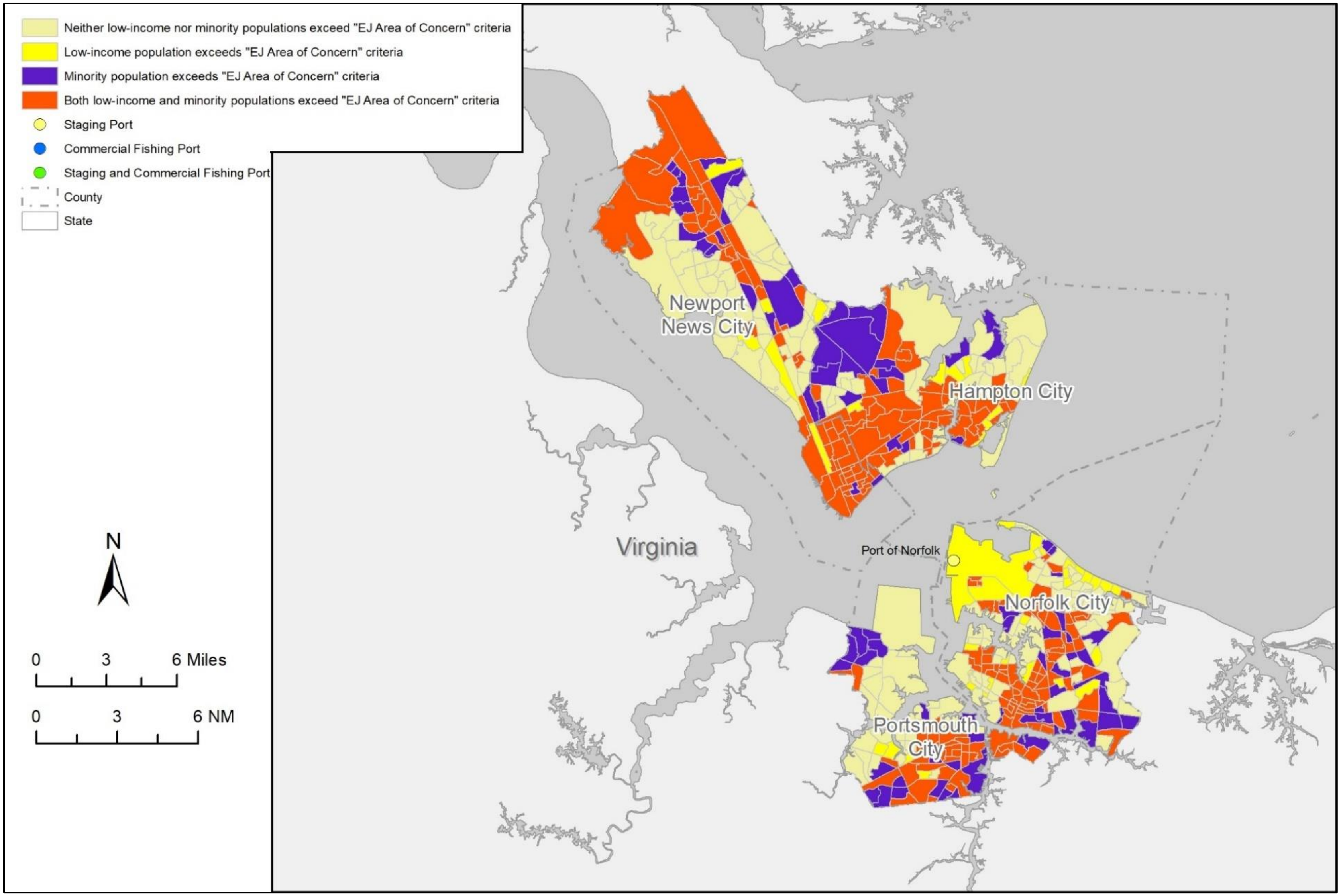
Source: Developed from information in EPA (2021).

Figure G-31. Census block groups that are potential environmental justice areas of concern in Gloucester County, New Jersey; Philadelphia County, Pennsylvania; and Delaware County, Pennsylvania.



Source: Developed from information in EPA (2021).

Figure G-32. Census block groups that are potential environmental justice areas of concern in Baltimore County, Baltimore City, and Anne Arundel County, Maryland.



Source: Developed from information in EPA (2021).

Figure G-33. Census block groups that are potential environmental justice areas of concern in the cities of Norfolk, Portsmouth, Newport News, and Hampton, Virginia.

Table G-EJ1. Census Tracts (CT) and Block Groups (BG) in Plymouth County, Massachusetts (County ID 25-023) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 5001.01 BG 3	Hull	2
CT 5021.01 BG 4	Rockland	2
CT 5021.02 BG 3	Rockland	1
CT 5031.02 BG 3	Hanover	2
CT 5031.02 BG 5	Hanover	2
CT 5031.02 BG 6	Hanover	2
CT 5051.01 BG 4	Scituate	3
CT 5052 BG 1	Scituate	2
CT 5052 BG 2	Scituate	2
CT 5061.01 BG 3	Marshfield	2
CT 5061.02 BG 1	Marshfield	2
CT 5061.02 BG 3	Marshfield	1
CT 5061.02 BG 4	Marshfield	2
CT 5062.02 BG 1	Marshfield	2
CT 5062.03 BG 1	Marshfield	2
CT 5062.04 BG 2	Marshfield	2
CT 5081.02 BG 1	Pembroke	2
CT 5091.01 BG 3	Kingston	2
CT 5091.02 BG 1	Kingston	2
CT 5101 BG 1	Brockton	1
CT 5101 BG 2	Brockton	3
CT 5101 BG 3	Brockton	3
CT 5101 BG 4	Brockton	1
CT 5102 BG 1	Brockton	3
CT 5102 BG 2	Brockton	3
CT 5102 BG 3	Brockton	3
CT 5102 BG 4	Brockton	1
CT 5103 BG 1	Brockton	1
CT 5103 BG 2	Brockton	1
CT 5103 BG 3	Brockton	1
CT 5104 BG 1	Brockton	1
CT 5104 BG 2	Brockton	1
CT 5104 BG 3	Brockton	1
CT 5104 BG 4	Brockton	1
CT 5105.01 BG 1	Brockton	1
CT 5105.01 BG 2	Brockton	1
CT 5105.02 BG 1	Brockton	1
CT 5105.02 BG 2	Brockton	1
CT 5105.02 BG 3	Brockton	1
CT 5105.02 BG 4	Brockton	1
CT 5105.02 BG 5	Brockton	1
CT 5105.03 BG 1	Brockton	1
CT 5105.03 BG 2	Brockton	1

Census Tract & Block Group ID	Place Name	Category
CT 5105.03 BG 3	Brockton	3
CT 5106 BG 1	Brockton	1
CT 5106 BG 2	Brockton	3
CT 5106 BG 3	Brockton	3
CT 5107 BG 1	Brockton	1
CT 5107 BG 2	Brockton	1
CT 5107 BG 3	Brockton	3
CT 5107 BG 4	Brockton	1
CT 5107 BG 5	Brockton	1
CT 5107 BG 6	Brockton	1
CT 5108 BG 1	Brockton	1
CT 5108 BG 2	Brockton	1
CT 5108 BG 3	Brockton	1
CT 5108 BG 4	Brockton	1
CT 5108 BG 5	Brockton	1
CT 5108 BG 6	Brockton	1
CT 5109 BG 1	Brockton	1
CT 5109 BG 2	Brockton	1
CT 5109 BG 3	Brockton	1
CT 5110 BG 1	Brockton	1
CT 5110 BG 2	Brockton	1
CT 5111 BG 1	Brockton	3
CT 5111 BG 2	Brockton	1
CT 5111 BG 3	Brockton	3
CT 5111 BG 4	Brockton	1
CT 5111 BG 5	Brockton	3
CT 5111 BG 6	Brockton	3
CT 5112 BG 1	Brockton	1
CT 5112 BG 2	Brockton	3
CT 5112 BG 3	Brockton	1
CT 5112 BG 4	Brockton	3
CT 5112 BG 5	Brockton	1
CT 5113.01 BG 1	Brockton	1
CT 5113.01 BG 2	Brockton	3
CT 5113.01 BG 3	Brockton	1
CT 5113.01 BG 4	Brockton	1
CT 5113.01 BG 5	Brockton	3
CT 5113.02 BG 1	East Bridgewater	1
CT 5113.02 BG 2	Brockton	3
CT 5113.02 BG 3	Brockton	1
CT 5113.02 BG 4	Brockton	1
CT 5114 BG 1	Brockton	1
CT 5114 BG 2	Brockton	1

Census Tract & Block Group ID	Place Name	Category
CT 5114 BG 3	Brockton	1
CT 5114 BG 4	Brockton	1
CT 5115 BG 1	Brockton	1
CT 5115 BG 2	Brockton	1
CT 5115 BG 3	Brockton	1
CT 5115 BG 4	Brockton	1
CT 5116 BG 1	Brockton	1
CT 5116 BG 2	Brockton	1
CT 5116 BG 3	Brockton	1
CT 5116 BG 4	Brockton	3
CT 5116 BG 5	Brockton	3
CT 5116 BG 6	Brockton	1
CT 5116 BG 7	Brockton	2
CT 5117.01 BG 1	Brockton	3
CT 5117.01 BG 2	Brockton	3
CT 5117.01 BG 3	Brockton	3
CT 5117.01 BG 4	Brockton	3
CT 5117.01 BG 5	Brockton	3
CT 5117.02 BG 1	Brockton	3
CT 5117.02 BG 2	Brockton	3
CT 5201 BG 1	Abington	2
CT 5202.01 BG 1	Abington	3
CT 5202.01 BG 2	Abington	1
CT 5202.02 BG 1	Abington	2
CT 5211.01 BG 2	Whitman	2
CT 5211.02 BG 1	Whitman	2
CT 5211.02 BG 2	Whitman	2
CT 5212.01 BG 3	Whitman	2
CT 5221.02 BG 4	Hanson	2
CT 5231 BG 1	East Bridgewater	1
CT 5232.01 BG 1	East Bridgewater	2
CT 5232.02 BG 1	East Bridgewater	2
CT 5232.02 BG 2	East Bridgewater	1
CT 5241.01 BG 3	West Bridgewater	2
CT 5241.02 BG 1	West Bridgewater	2
CT 5251.01 BG 1	Bridgewater	3
CT 5251.01 BG 2	Bridgewater	3
CT 5251.01 BG 3	Bridgewater	2
CT 5251.01 BG 4	Bridgewater	2
CT 5251.04 BG 3	Bridgewater	2
CT 5252.03 BG 2	Bridgewater	2
CT 5252.03 BG 3	Bridgewater	1
CT 5252.04 BG 1	Bridgewater	3

Census Tract & Block Group ID	Place Name	Category
CT 5253 BG 1	Bridgewater	3
CT 5301 BG 2	Plymouth	1
CT 5302 BG 1	Plymouth	2
CT 5302 BG 2	Plymouth	2
CT 5302 BG 3	Plymouth	2
CT 5303 BG 2	Plymouth	1
CT 5303 BG 3	Plymouth	2
CT 5303 BG 4	Plymouth	2
CT 5305 BG 1	Plymouth	2
CT 5305 BG 3	Plymouth	1
CT 5305 BG 5	Plymouth	2
CT 5306 BG 1	Plymouth	3
CT 5308.01 BG 2	Plymouth	2
CT 5308.02 BG 5	Plymouth	2
CT 5309.01 BG 4	Plymouth	2
CT 5401.01 BG 2	Lakeville	2
CT 5423 BG 1	Middleborough	2
CT 5423 BG 2	Middleborough	2
CT 5423 BG 4	Middleborough	1
CT 5423 BG 5	Middleborough	2
CT 5423 BG 6	Middleborough	2
CT 5441 BG 1	Carver	3
CT 5441 BG 4	Carver	2
CT 5442 BG 1	Carver	2
CT 5442 BG 3	Carver	2
CT 5442 BG 4	Carver	2
CT 5451 BG 1	Wareham	1
CT 5451 BG 2	Wareham	2
CT 5451 BG 4	Wareham	2
CT 5452 BG 1	Wareham	3
CT 5452 BG 2	Wareham	3
CT 5452 BG 3	Wareham	1
CT 5452 BG 4	Wareham	1
CT 5453 BG 1	Wareham	1
CT 5453 BG 3	Wareham	2
CT 5453 BG 4	Wareham	2
CT 5454 BG 1	Wareham	1
CT 5454 BG 2	Wareham	2
CT 5454 BG 5	Wareham	1
CT 5601 BG 4	Mattapoisett	1
CT 5611 BG 4	Marion	2
CT 5611 BG 5	Marion	1
CT 5612 BG 1	Bridgewater	1

Table G-EJ2. Census Tracts (CT) and Block Groups (BG) in Bristol County, Massachusetts (County ID 25-005) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 6002.02 BG 2	Easton	3
CT 6002.02 BG 3	Easton	2
CT 6002.03 BG 2	Easton	3
CT 6101 BG 3	Mansfield	3
CT 6102.03 BG 3	Mansfield	3
CT 6102.04 BG 3	Mansfield	3
CT 6122 BG 2	Raynham	3
CT 6131 BG 1	Taunton	2
CT 6131 BG 2	Taunton	3
CT 6131 BG 3	Taunton	2
CT 6131 BG 4	Taunton	3
CT 6133 BG 2	Taunton	3
CT 6134 BG 2	Taunton	1
CT 6136 BG 1	Taunton	1
CT 6136 BG 2	Taunton	2
CT 6137 BG 2	Taunton	1
CT 6138 BG 1	Taunton	1
CT 6138 BG 2	Taunton	1
CT 6138 BG 3	Taunton	1
CT 6138 BG 4	Taunton	1
CT 6139.01 BG 2	Taunton	1
CT 6139.02 BG 1	Taunton	3
CT 6139.02 BG 2	Taunton	1
CT 6140 BG 1	Taunton	1
CT 6140 BG 2	Taunton	1
CT 6141.01 BG 1	Taunton	3
CT 6141.01 BG 2	Taunton	1
CT 6141.01 BG 3	Taunton	1
CT 6141.02 BG 1	Taunton	2
CT 6301.01 BG 1	North Attleborough	3
CT 6301.01 BG 2	North Attleborough	1
CT 6301.02 BG 2	North Attleborough	2
CT 6301.02 BG 3	North Attleborough	2
CT 6302 BG 4	North Attleborough	1
CT 6303 BG 3	North Attleborough	2
CT 6304 BG 3	North Attleborough	3
CT 6311 BG 1	Attleboro	3
CT 6311 BG 3	Attleboro	1
CT 6311 BG 4	Attleboro	2
CT 6311 BG 5	Attleboro	3
CT 6312 BG 3	Attleboro	1
CT 6312 BG 5	Attleboro	3
CT 6313 BG 3	Attleboro	2

Census Tract & Block Group ID	Place Name	Category
CT 6314 BG 1	Attleboro	1
CT 6314 BG 2	Attleboro	3
CT 6315 BG 1	Attleboro	3
CT 6315 BG 2	Attleboro	2
CT 6316 BG 1	Attleboro	1
CT 6316 BG 2	Attleboro	3
CT 6316 BG 3	Attleboro	1
CT 6317 BG 1	Attleboro	1
CT 6317 BG 2	Attleboro	2
CT 6322 BG 2	Seekonk	2
CT 6401 BG 1	Fall River	1
CT 6401 BG 2	Fall River	1
CT 6401 BG 4	Fall River	1
CT 6401 BG 5	Tiverton	2
CT 6402 BG 1	Fall River	2
CT 6402 BG 2	Fall River	2
CT 6402 BG 3	Fall River	1
CT 6402 BG 4	Fall River	2
CT 6402 BG 5	Fall River	1
CT 6403 BG 1	Fall River	1
CT 6403 BG 2	Fall River	1
CT 6403 BG 3	Fall River	1
CT 6404 BG 1	Fall River	2
CT 6404 BG 2	Fall River	1
CT 6404 BG 3	Fall River	2
CT 6405 BG 1	Fall River	2
CT 6405 BG 2	Fall River	1
CT 6405 BG 3	Fall River	3
CT 6405 BG 4	Fall River	3
CT 6405 BG 5	Fall River	1
CT 6406 BG 1	Fall River	2
CT 6406 BG 2	Fall River	1
CT 6406 BG 3	Fall River	1
CT 6406 BG 4	Fall River	1
CT 6407 BG 1	Fall River	2
CT 6407 BG 2	Fall River	1
CT 6408 BG 1	Fall River	1
CT 6408 BG 2	Fall River	2
CT 6409.01 BG 1	Fall River	1
CT 6409.01 BG 2	Fall River	2
CT 6409.01 BG 3	Fall River	1
CT 6409.01 BG 4	Fall River	1
CT 6409.01 BG 5	Fall River	1

Census Tract & Block Group ID	Place Name	Category
CT 6410 BG 1	Fall River	1
CT 6410 BG 2	Fall River	1
CT 6410 BG 3	Fall River	1
CT 6411.01 BG 1	Fall River	1
CT 6411.01 BG 2	Fall River	1
CT 6412 BG 1	Fall River	1
CT 6412 BG 2	Fall River	2
CT 6413 BG 1	Fall River	1
CT 6413 BG 2	Fall River	1
CT 6413 BG 3	Fall River	1
CT 6413 BG 4	Fall River	1
CT 6413 BG 5	Fall River	1
CT 6414 BG 1	Fall River	1
CT 6414 BG 2	Fall River	1
CT 6414 BG 3	Fall River	1
CT 6415 BG 1	Fall River	1
CT 6415 BG 2	Fall River	2
CT 6416 BG 2	Fall River	2
CT 6417 BG 2	Fall River	2
CT 6417 BG 3	Fall River	2
CT 6417 BG 4	Fall River	1
CT 6418 BG 1	Fall River	3
CT 6418 BG 3	Fall River	2
CT 6419 BG 1	Fall River	1
CT 6419 BG 2	Fall River	1
CT 6420 BG 1	Fall River	2
CT 6420 BG 2	Fall River	1
CT 6420 BG 3	Fall River	1
CT 6421 BG 2	Fall River	1
CT 6421 BG 3	Fall River	3
CT 6422 BG 1	Fall River	2
CT 6422 BG 2	Fall River	1
CT 6422 BG 3	Fall River	1
CT 6422 BG 4	Fall River	2
CT 6424 BG 1	Fall River	1
CT 6442 BG 5	Somerset	2
CT 6451.01 BG 3	Swansea	2
CT 6451.02 BG 3	Swansea	2
CT 6461.01 BG 2	Westport	2
CT 6461.01 BG 3	Westport	2
CT 6501.02 BG 1	New Bedford	1
CT 6501.02 BG 2	New Bedford	2
CT 6501.02 BG 3	New Bedford	1
CT 6502.01 BG 3	New Bedford	1
CT 6502.02 BG 1	New Bedford	2
CT 6503 BG 1	New Bedford	3
CT 6503 BG 2	New Bedford	1
CT 6503 BG 3	New Bedford	1
CT 6504 BG 1	New Bedford	2
CT 6504 BG 2	New Bedford	2
CT 6504 BG 3	New Bedford	1
CT 6505 BG 1	New Bedford	2
CT 6505 BG 2	New Bedford	2
CT 6505 BG 3	New Bedford	1
CT 6506 BG 1	New Bedford	1
CT 6506 BG 2	New Bedford	1
CT 6506 BG 3	New Bedford	1
CT 6507 BG 1	New Bedford	1
CT 6507 BG 2	New Bedford	1
CT 6508 BG 1	New Bedford	1
CT 6508 BG 2	New Bedford	1
CT 6508 BG 3	New Bedford	1
CT 6508 BG 4	New Bedford	1
CT 6509 BG 1	New Bedford	1
CT 6509 BG 2	New Bedford	1
CT 6509 BG 3	New Bedford	1
CT 6510.01 BG 1	New Bedford	1
CT 6510.02 BG 1	New Bedford	3
CT 6510.02 BG 2	New Bedford	1
CT 6511 BG 1	New Bedford	1
CT 6511 BG 2	New Bedford	1
CT 6511 BG 3	New Bedford	1
CT 6511 BG 4	New Bedford	2
CT 6512 BG 1	New Bedford	1
CT 6512 BG 2	New Bedford	1
CT 6513 BG 1	New Bedford	1
CT 6513 BG 2	New Bedford	1
CT 6514 BG 1	New Bedford	1
CT 6514 BG 2	New Bedford	1
CT 6514 BG 3	New Bedford	1
CT 6514 BG 4	New Bedford	1
CT 6515 BG 1	New Bedford	1
CT 6515 BG 2	New Bedford	1
CT 6515 BG 3	New Bedford	1
CT 6515 BG 4	New Bedford	1
CT 6516 BG 1	New Bedford	1
CT 6516 BG 2	New Bedford	1
CT 6516 BG 3	New Bedford	3
CT 6516 BG 4	New Bedford	1
CT 6517 BG 1	New Bedford	1
CT 6517 BG 2	New Bedford	1
CT 6518 BG 1	New Bedford	1
CT 6518 BG 2	New Bedford	1
CT 6519 BG 1	New Bedford	1
CT 6519 BG 2	New Bedford	1
CT 6520 BG 1	New Bedford	1

Census Tract & Block Group ID	Place Name	Category
CT 6520 BG 2	New Bedford	1
CT 6520 BG 3	New Bedford	1
CT 6521 BG 1	New Bedford	1
CT 6521 BG 3	New Bedford	1
CT 6523 BG 1	New Bedford	2
CT 6523 BG 2	New Bedford	1
CT 6524 BG 1	New Bedford	1
CT 6524 BG 2	New Bedford	1
CT 6525 BG 1	New Bedford	1
CT 6525 BG 2	New Bedford	1
CT 6526 BG 1	New Bedford	1
CT 6526 BG 2	New Bedford	1
CT 6527 BG 1	New Bedford	1
CT 6527 BG 2	New Bedford	1
CT 6527 BG 3	New Bedford	1
CT 6527 BG 4	New Bedford	1
CT 6528 BG 1	New Bedford	2
CT 6528 BG 3	New Bedford	1

Census Tract & Block Group ID	Place Name	Category
CT 6531.01 BG 3	Dartmouth	2
CT 6531.02 BG 2	Dartmouth	3
CT 6533.01 BG 3	Dartmouth	2
CT 6541 BG 3	Acushnet	3
CT 6541 BG 4	Acushnet	2
CT 6542 BG 1	Acushnet	2
CT 6542 BG 2	Acushnet	2
CT 6542 BG 3	Acushnet	1
CT 6552 BG 1	Fairhaven	3
CT 6552 BG 2	Fairhaven	2
CT 6552 BG 3	Fairhaven	1
CT 6552 BG 4	Fairhaven	2
CT 6552 BG 5	Fairhaven	1
CT 6553 BG 1	Fairhaven	2
CT 6553 BG 3	Fairhaven	2
CT 6554 BG 4	Fairhaven	2
CT 9855 BG 1	Dartmouth	3

Table G-EJ3. Census Tracts (CT) and Block Groups (BG) in Barnstable County, Massachusetts (County ID 25-001) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 101 BG 1	Provincetown	2
CT 101 BG 2	Provincetown	1
CT 101 BG 3	Provincetown	3
CT 101 BG 4	Provincetown	1
CT 102.06 BG 1	Wellfleet	2
CT 102.06 BG 2	Wellfleet	1
CT 102.06 BG 3	Wellfleet	2
CT 102.08 BG 2	Truro	2
CT 102.08 BG 3	Truro	2
CT 103.04 BG 2	Eastham	2
CT 103.04 BG 3	Eastham	3
CT 103.06 BG 1	Eastham	1
CT 103.06 BG 2	Eastham	1
CT 104 BG 2	Orleans	1
CT 105 BG 1	Orleans	2
CT 106 BG 3	Chatham	1
CT 107 BG 4	Chatham	2
CT 108 BG 1	Brewster	2
CT 108 BG 5	Brewster	2
CT 109 BG 2	Brewster	3

Census Tract & Block Group ID	Place Name	Category
CT 110.02 BG 3	Harwich	2
CT 110.02 BG 4	Harwich	1
CT 112 BG 1	Harwich	2
CT 112 BG 2	Harwich	1
CT 112 BG 3	Harwich	2
CT 112 BG 4	Harwich	2
CT 113 BG 1	Dennis	2
CT 114 BG 4	Dennis	1
CT 115 BG 1	Dennis	1
CT 115 BG 2	Dennis	2
CT 115 BG 4	Dennis	2
CT 115 BG 5	Dennis	1
CT 116 BG 1	Dennis	1
CT 116 BG 2	Dennis	2
CT 116 BG 3	Dennis	2
CT 117 BG 1	Dennis	1
CT 117 BG 3	Dennis	2
CT 118.02 BG 1	Yarmouth	2
CT 118.02 BG 3	Yarmouth	2
CT 118.02 BG 4	Yarmouth	1

Census Tract & Block Group ID	Place Name	Category
CT 120.01 BG 2	Yarmouth	2
CT 120.01 BG 4	Yarmouth	2
CT 120.02 BG 1	Yarmouth	1
CT 121.01 BG 1	Yarmouth	3
CT 121.01 BG 2	Yarmouth	3
CT 121.01 BG 3	Yarmouth	2
CT 121.01 BG 4	Yarmouth	1
CT 121.01 BG 5	Yarmouth	2
CT 121.02 BG 1	Yarmouth	1
CT 121.02 BG 2	Yarmouth	3
CT 121.02 BG 3	Yarmouth	2
CT 121.02 BG 4	Yarmouth	1
CT 125.02 BG 1	Barnstable	3
CT 125.02 BG 2	Barnstable	1
CT 125.02 BG 3	Barnstable	3
CT 125.02 BG 4	Barnstable	1
CT 126.01 BG 1	Barnstable	1
CT 126.01 BG 2	Barnstable	1
CT 126.02 BG 1	Barnstable	1
CT 126.02 BG 2	Barnstable	1
CT 126.02 BG 3	Barnstable	1
CT 126.02 BG 4	Barnstable	3
CT 127 BG 1	Barnstable	2
CT 127 BG 2	Barnstable	2
CT 127 BG 4	Barnstable	3
CT 128 BG 2	Barnstable	2
CT 129 BG 1	Barnstable	3
CT 130.02 BG 3	Barnstable	3
CT 131 BG 1	Barnstable	2
CT 133 BG 1	Sandwich	1
CT 135 BG 4	Sandwich	3
CT 136 BG 2	Sandwich	2
CT 136 BG 3	Sandwich	3
CT 137 BG 4	Bourne	3
CT 138 BG 1	Bourne	3
CT 138 BG 2	Bourne	3
CT 138 BG 3	Bourne	3
CT 139 BG 1	Bourne	2
CT 139 BG 3	Bourne	1
CT 140.02 BG 3	Bourne	2
CT 140.02 BG 4	Bourne	1
CT 141 BG 1	Bourne	1
CT 144.02 BG 1	Falmouth	3
CT 144.02 BG 2	Falmouth	3
CT 144.02 BG 3	Falmouth	3
CT 145 BG 1	Falmouth	2
CT 145 BG 2	Falmouth	2
CT 145 BG 3	Falmouth	1
CT 146 BG 2	Falmouth	1
CT 146 BG 3	Falmouth	1
CT 146 BG 4	Falmouth	3
CT 147 BG 1	Falmouth	3
CT 147 BG 2	Falmouth	2
CT 147 BG 3	Falmouth	1
CT 148 BG 1	Falmouth	1
CT 148 BG 3	Falmouth	1
CT 148 BG 4	Falmouth	3
CT 149 BG 3	Falmouth	1
CT 150.01 BG 1	Mashpee	1
CT 150.01 BG 2	Mashpee	3
CT 150.02 BG 1	Mashpee	1
CT 150.02 BG 2	Mashpee	1
CT 151 BG 1	Mashpee	3
CT 153 BG 1	Barnstable	1
CT 153 BG 2	Barnstable	1
CT 153 BG 3	Barnstable	1

Table G-EJ4. Census Tracts (CT) and Block Groups (BG) in Nantucket County, Massachusetts (County ID 25-019) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 9501 BG 1	Nantucket	2
CT 9501 BG 2	Nantucket	1
CT 9502 BG 1	Nantucket	3
CT 9502 BG 2	Nantucket	1
CT 9502 BG 4	Nantucket	1
CT 9504 BG 2	Nantucket	1

Table G-EJ5. Census Tracts (CT) and Block Groups (BG) in Dukes County, Massachusetts (County ID 25-007) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 2001 BG 1	Tisbury	2
CT 2001 BG 2	Tisbury	3
CT 2001 BG 4	Tisbury	1
CT 2001 BG 5	Tisbury	1
CT 2002 BG 1	Oak Bluffs	2
CT 2002 BG 2	Oak Bluffs	3
CT 2002 BG 3	Oak Bluffs	3
CT 2002 BG 4	Oak Bluffs	2
CT 2002 BG 5	Oak Bluffs	2
CT 2003 BG 2	Edgartown	3
CT 2003 BG 3	Edgartown	3
CT 2003 BG 4	Edgartown	2
CT 2004 BG 5	Aquinnah	3

Table G-EJ6. Census Tracts (CT) and Block Groups (BG) in Providence County, Rhode Island (County ID 44-007) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 1.01 BG 1	Providence	1
CT 1.01 BG 2	Providence	1
CT 1.01 BG 3	Providence	1
CT 1.01 BG 4	Providence	3
CT 1.02 BG 1	Providence	1
CT 1.02 BG 2	Providence	1
CT 1.02 BG 3	Providence	1
CT 1.02 BG 4	Providence	1
CT 10 BG 1	Providence	1
CT 10 BG 2	Providence	1
CT 101.02 BG 2	East Providence	2
CT 102 BG 2	East Providence	2
CT 102 BG 3	East Providence	3
CT 102 BG 4	East Providence	3
CT 102 BG 5	East Providence	2
CT 102 BG 6	East Providence	1
CT 102 BG 7	East Providence	3
CT 103 BG 1	East Providence	2
CT 104 BG 1	East Providence	2
CT 104 BG 2	East Providence	3
CT 104 BG 5	East Providence	2
CT 105.01 BG 1	East Providence	2
CT 105.02 BG 3	East Providence	2
CT 105.02 BG 4	East Providence	3
CT 106 BG 1	East Providence	2
CT 106 BG 6	East Providence	2
CT 107.02 BG 4	East Providence	2
CT 108 BG 1	Central Falls	1
CT 108 BG 2	Central Falls	1
CT 108 BG 3	Central Falls	1
CT 109 BG 1	Central Falls	1
CT 109 BG 2	Central Falls	1
CT 109 BG 3	Central Falls	1
CT 11 BG 1	Providence	1
CT 11 BG 2	Providence	2
CT 11 BG 3	Providence	2
CT 110 BG 1	Central Falls	1
CT 110 BG 2	Central Falls	1
CT 110 BG 3	Central Falls	1
CT 111 BG 1	Central Falls	1
CT 111 BG 2	Central Falls	1
CT 112 BG 5	Cumberland	2
CT 115 BG 4	Lincoln	2
CT 117.01 BG 2	Lincoln	2
CT 117.02 BG 1	Lincoln	2
CT 118 BG 2	North Providence	2
CT 118 BG 3	North Providence	2
CT 118 BG 4	North Providence	1
CT 119.01 BG 2	North Providence	3
CT 12 BG 1	Providence	1
CT 12 BG 2	Providence	1
CT 12 BG 3	Providence	1
CT 120 BG 2	North Providence	2
CT 120 BG 4	North Providence	2
CT 121.04 BG 2	North Providence	2
CT 123 BG 1	Johnston	2
CT 124.01 BG 1	Johnston	3
CT 125 BG 1	Johnston	2
CT 126.02 BG 2	Smithfield	2
CT 129 BG 1	Burrillville	2

Census Tract & Block Group ID	Place Name	Category
CT 13 BG 1	Providence	1
CT 13 BG 2	Providence	1
CT 13 BG 3	Providence	1
CT 13 BG 4	Providence	1
CT 130.02 BG 4	Burrillville	2
CT 131.01 BG 2	Glocester	2
CT 135 BG 2	Cranston	1
CT 135 BG 3	Cranston	2
CT 135 BG 4	Cranston	1
CT 135 BG 5	Cranston	3
CT 136 BG 2	Warwick	1
CT 137.01 BG 1	Cranston	3
CT 137.01 BG 2	Cranston	3
CT 137.01 BG 4	Cranston	2
CT 137.02 BG 1	Cranston	2
CT 137.02 BG 2	Cranston	2
CT 14 BG 1	Providence	1
CT 14 BG 2	Providence	1
CT 14 BG 3	Providence	3
CT 14 BG 4	Providence	1
CT 14 BG 5	Providence	1
CT 140 BG 2	Cranston	2
CT 140 BG 3	Cranston	1
CT 140 BG 4	Cranston	3
CT 141 BG 1	Cranston	1
CT 141 BG 2	Cranston	1
CT 141 BG 3	Cranston	2
CT 141 BG 4	Cranston	3
CT 142 BG 2	Cranston	1
CT 145.02 BG 3	Cranston	2
CT 147 BG 1	Cranston	3
CT 147 BG 2	Cranston	1
CT 147 BG 3	Cranston	1
CT 147 BG 4	Cranston	2
CT 147 BG 5	Cranston	2
CT 147 BG 6	Cranston	3
CT 148 BG 3	Cranston	2
CT 15 BG 1	Providence	1
CT 15 BG 2	Providence	1
CT 15 BG 3	Providence	3
CT 150 BG 1	Pawtucket	3
CT 150 BG 2	Pawtucket	1
CT 151 BG 1	Pawtucket	1
CT 151 BG 2	Pawtucket	1
CT 151 BG 3	Pawtucket	1
CT 152 BG 1	Pawtucket	1
CT 152 BG 2	Pawtucket	1
CT 153 BG 1	Pawtucket	1
CT 153 BG 2	Pawtucket	2
CT 154 BG 1	Pawtucket	1
CT 154 BG 2	Pawtucket	1
CT 155 BG 2	Pawtucket	1
CT 155 BG 3	Pawtucket	1
CT 155 BG 4	Pawtucket	3
CT 156 BG 1	Pawtucket	1
CT 156 BG 3	Pawtucket	2
CT 159 BG 1	Pawtucket	3
CT 159 BG 2	Pawtucket	2
CT 159 BG 3	Pawtucket	3
CT 159 BG 4	Pawtucket	2
CT 16 BG 1	Providence	1
CT 16 BG 2	Providence	1
CT 16 BG 3	Providence	1
CT 16 BG 4	Providence	1
CT 16 BG 5	Providence	1
CT 16 BG 6	Providence	1
CT 16 BG 7	Providence	3
CT 160 BG 1	Pawtucket	1
CT 160 BG 2	Pawtucket	1
CT 160 BG 3	Pawtucket	3
CT 161 BG 1	Pawtucket	1
CT 161 BG 2	Pawtucket	3
CT 161 BG 3	Pawtucket	1
CT 161 BG 4	Pawtucket	1
CT 163 BG 1	Pawtucket	3
CT 163 BG 2	Pawtucket	3
CT 164 BG 1	Pawtucket	1
CT 164 BG 2	Pawtucket	1
CT 164 BG 3	Pawtucket	1
CT 165 BG 2	Pawtucket	2
CT 166 BG 1	Pawtucket	1
CT 167 BG 1	Pawtucket	1
CT 167 BG 2	Pawtucket	1
CT 168 BG 3	Pawtucket	2
CT 17 BG 1	Providence	3
CT 17 BG 2	Providence	1
CT 17 BG 3	Providence	1
CT 170 BG 4	Pawtucket	3
CT 171 BG 1	Pawtucket	3
CT 171 BG 2	Pawtucket	3
CT 171 BG 3	Pawtucket	1
CT 171 BG 4	Pawtucket	2
CT 173 BG 1	Woonsocket	2
CT 173 BG 2	Woonsocket	2
CT 174 BG 1	Woonsocket	1
CT 174 BG 2	Woonsocket	2
CT 174 BG 3	Woonsocket	1
CT 175 BG 2	Woonsocket	2
CT 175 BG 3	Woonsocket	2
CT 176 BG 1	Woonsocket	1
CT 176 BG 2	Woonsocket	1
CT 178 BG 1	Woonsocket	2
CT 178 BG 2	Woonsocket	2
CT 178 BG 3	Woonsocket	1
CT 179 BG 1	Woonsocket	2
CT 179 BG 2	Woonsocket	2
CT 179 BG 3	Woonsocket	2
CT 18 BG 1	Providence	1

Census Tract & Block Group ID	Place Name	Category
CT 18 BG 2	Providence	1
CT 18 BG 3	Providence	1
CT 18 BG 4	Providence	1
CT 18 BG 5	Providence	1
CT 18 BG 6	Providence	1
CT 180 BG 1	Woonsocket	1
CT 180 BG 2	Woonsocket	1
CT 180 BG 3	Woonsocket	2
CT 181 BG 1	Woonsocket	1
CT 181 BG 2	Woonsocket	1
CT 182 BG 2	Woonsocket	2
CT 183 BG 1	Woonsocket	1
CT 184 BG 1	Woonsocket	2
CT 184 BG 3	Woonsocket	1
CT 184 BG 5	Woonsocket	1
CT 185 BG 1	Woonsocket	2
CT 19 BG 1	Providence	1
CT 19 BG 2	Providence	1
CT 19 BG 3	Providence	1
CT 19 BG 4	Providence	3
CT 19 BG 5	Providence	1
CT 19 BG 6	Providence	1
CT 2 BG 1	Providence	3
CT 2 BG 2	Providence	1
CT 2 BG 3	Providence	1
CT 2 BG 4	Providence	1
CT 2 BG 5	Providence	1
CT 20 BG 1	Providence	1
CT 20 BG 2	Providence	1
CT 20 BG 3	Providence	1
CT 20 BG 4	Providence	3
CT 21.01 BG 1	Providence	1
CT 21.01 BG 2	Providence	3
CT 21.01 BG 3	Providence	1
CT 21.02 BG 1	Providence	3
CT 21.02 BG 2	Providence	1
CT 21.02 BG 3	Providence	1
CT 21.02 BG 4	Providence	1
CT 21.02 BG 5	Providence	3
CT 22 BG 1	Providence	1
CT 22 BG 2	Providence	1
CT 22 BG 3	Providence	1
CT 22 BG 4	Providence	1
CT 23 BG 1	Providence	2
CT 23 BG 4	Providence	2
CT 23 BG 5	Providence	3
CT 23 BG 6	Providence	3
CT 24 BG 1	Providence	2
CT 24 BG 2	Providence	1
CT 24 BG 4	Providence	1
CT 25 BG 1	Providence	1
CT 25 BG 2	Providence	3
CT 26 BG 1	Providence	1
CT 26 BG 2	Providence	1
CT 26 BG 3	Providence	1
CT 27 BG 1	Providence	1
CT 27 BG 2	Providence	1
CT 27 BG 3	Providence	1
CT 27 BG 4	Providence	2
CT 28 BG 1	Providence	1
CT 28 BG 2	Providence	1
CT 28 BG 3	Providence	1
CT 28 BG 4	Providence	1
CT 29 BG 1	Providence	3
CT 29 BG 2	Providence	1
CT 29 BG 3	Providence	1
CT 29 BG 4	Providence	1
CT 29 BG 5	Providence	1
CT 3 BG 1	Providence	1
CT 3 BG 2	Providence	1
CT 3 BG 3	Providence	1
CT 3 BG 4	Providence	1
CT 3 BG 5	Providence	1
CT 3 BG 6	Providence	3
CT 31 BG 2	Providence	1
CT 31 BG 3	Providence	1
CT 31 BG 5	Providence	1
CT 32 BG 1	Providence	2
CT 32 BG 4	Providence	3
CT 33 BG 4	Providence	2
CT 35 BG 2	Providence	2
CT 35 BG 3	Providence	3
CT 36.01 BG 1	Providence	1
CT 36.02 BG 1	Providence	3
CT 36.02 BG 3	Providence	2
CT 37 BG 1	Providence	1
CT 37 BG 2	Providence	1
CT 37 BG 3	Providence	2
CT 37 BG 4	Providence	2
CT 4 BG 1	Providence	1
CT 4 BG 2	Providence	1
CT 4 BG 3	Providence	1
CT 4 BG 4	Providence	1
CT 5 BG 1	Providence	1
CT 5 BG 2	Providence	1
CT 5 BG 3	Providence	1
CT 6 BG 1	Providence	3
CT 6 BG 2	Providence	1
CT 7 BG 1	Providence	1
CT 7 BG 2	Providence	1
CT 7 BG 3	Providence	1
CT 8 BG 1	Providence	3
CT 8 BG 2	Providence	1
CT 8 BG 3	Providence	1
CT 9 BG 1	Providence	1
CT 9 BG 2	Providence	1

Table G-EJ7. Census Tracts (CT) and Block Groups (BG) in Bristol County, Rhode Island (County ID 44-001) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 301 BG 1	Barrington	2
CT 301 BG 2	Barrington	3
CT 301 BG 3	Barrington	3
CT 301 BG 4	Barrington	1
CT 302 BG 2	Barrington	3
CT 303 BG 1	Barrington	3
CT 304 BG 2	Barrington	3
CT 305 BG 1	Warren	1
CT 305 BG 2	Warren	2
CT 305 BG 3	Warren	2
CT 306.01 BG 1	Warren	2
CT 306.02 BG 1	Warren	2

Census Tract & Block Group ID	Place Name	Category
CT 306.02 BG 3	Warren	2
CT 306.02 BG 4	Warren	2
CT 307 BG 1	Bristol	2
CT 307 BG 2	Bristol	2
CT 307 BG 3	Bristol	1
CT 307 BG 4	Bristol	1
CT 308 BG 1	Bristol	1
CT 308 BG 3	Bristol	1
CT 309.01 BG 1	Bristol	1
CT 309.02 BG 1	Bristol	3
CT 309.02 BG 3	Bristol	2
CT 309.02 BG 4	Bristol	1

Table G-EJ8. Census Tracts (CT) and Block Groups (BG) in Kent County, Rhode Island (County ID 44-003) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 201.01 BG 1	West Warwick	1
CT 201.01 BG 3	West Warwick	3
CT 201.02 BG 1	West Warwick	2
CT 201.02 BG 2	West Warwick	1
CT 201.02 BG 3	West Warwick	2
CT 202 BG 1	West Warwick	1
CT 202 BG 2	West Warwick	1
CT 202 BG 3	West Warwick	1
CT 203 BG 1	West Warwick	1
CT 203 BG 2	West Warwick	2
CT 203 BG 3	West Warwick	2
CT 203 BG 4	West Warwick	1
CT 203 BG 5	West Warwick	2
CT 204 BG 3	West Warwick	1
CT 205 BG 1	West Warwick	3
CT 205 BG 2	West Warwick	1
CT 206.01 BG 1	Coventry	2
CT 206.02 BG 1	Coventry	2
CT 206.02 BG 2	Coventry	1
CT 206.03 BG 1	Coventry	2
CT 206.04 BG 1	Coventry	2
CT 206.04 BG 2	Coventry	2
CT 207.03 BG 2	Coventry	2
CT 208 BG 1	West Greenwich	3

Census Tract & Block Group ID	Place Name	Category
CT 208 BG 2	West Greenwich	3
CT 209.01 BG 1	East Greenwich	1
CT 209.01 BG 3	East Greenwich	2
CT 209.03 BG 1	East Greenwich	3
CT 209.03 BG 2	East Greenwich	1
CT 209.03 BG 3	East Greenwich	3
CT 210.01 BG 1	Warwick	1
CT 210.01 BG 2	Warwick	3
CT 210.02 BG 1	Warwick	3
CT 210.02 BG 3	Warwick	3
CT 210.02 BG 4	Warwick	1
CT 211 BG 3	Warwick	1
CT 211 BG 4	Warwick	1
CT 212 BG 2	Warwick	1
CT 212 BG 3	Warwick	1
CT 213 BG 1	Warwick	1
CT 213 BG 3	Warwick	3
CT 213 BG 4	Warwick	3
CT 214.01 BG 1	Warwick	1
CT 214.01 BG 3	Warwick	3
CT 214.02 BG 1	Warwick	2
CT 214.02 BG 2	Warwick	1
CT 214.02 BG 3	Warwick	1
CT 215.01 BG 2	Warwick	2

Census Tract & Block Group ID	Place Name	Category
CT 215.01 BG 3	Warwick	2
CT 215.02 BG 1	Warwick	3
CT 215.02 BG 3	Warwick	3
CT 215.02 BG 4	Warwick	1
CT 216 BG 1	Warwick	3
CT 217 BG 2	Warwick	2
CT 217 BG 3	Warwick	3
CT 217 BG 4	Warwick	1
CT 217 BG 5	Warwick	1
CT 218 BG 1	Warwick	3
CT 219.01 BG 1	Warwick	1
CT 219.01 BG 2	Warwick	3
CT 219.01 BG 3	Warwick	2
CT 219.02 BG 1	Warwick	3
CT 219.02 BG 3	Warwick	3
CT 219.03 BG 3	Warwick	1
CT 220 BG 2	Warwick	2
CT 220 BG 3	Warwick	2
CT 221 BG 1	Warwick	1
CT 221 BG 2	Warwick	3
CT 222.01 BG 1	Warwick	3
CT 222.01 BG 4	Warwick	3
CT 222.01 BG 5	Warwick	2
CT 222.02 BG 2	Warwick	1
CT 222.02 BG 3	Warwick	3
CT 223 BG 2	Warwick	1
CT 223 BG 3	Warwick	1
CT 223 BG 4	Warwick	2

Table G-EJ9. Census Tracts (CT) and Block Groups (BG) in Washington County, Rhode Island (County ID 44-009) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 415 BG 1	New Shoreham	2
CT 501.02 BG 2	North Kingstown	2
CT 501.03 BG 1	North Kingstown	1
CT 501.03 BG 2	North Kingstown	1
CT 501.03 BG 3	North Kingstown	1
CT 501.03 BG 4	North Kingstown	2
CT 501.03 BG 5	North Kingstown	2
CT 503.01 BG 2	North Kingstown	3
CT 503.01 BG 3	North Kingstown	2
CT 503.02 BG 2	North Kingstown	3
CT 503.02 BG 3	North Kingstown	1
CT 504.02 BG 1	North Kingstown	2
CT 505 BG 3	Exeter	3
CT 506 BG 1	Richmond	3
CT 506 BG 3	Richmond	3
CT 507 BG 1	Hopkinton	2
CT 507 BG 3	Hopkinton	2
CT 507 BG 4	Hopkinton	2
CT 507 BG 6	Hopkinton	3
CT 508.01 BG 1	Westerly	1
CT 508.01 BG 2	Westerly	1
CT 508.01 BG 3	Westerly	1
CT 508.01 BG 4	Westerly	2
CT 508.01 BG 5	Westerly	1
CT 508.02 BG 1	Westerly	1
CT 508.02 BG 2	Westerly	3
CT 509.01 BG 2	Westerly	1
CT 509.02 BG 1	Westerly	2
CT 509.02 BG 2	Westerly	2
CT 510 BG 4	Westerly	2
CT 510 BG 5	Westerly	2
CT 511.01 BG 2	Charlestown	2
CT 511.02 BG 1	Charlestown	2
CT 512.01 BG 1	South Kingstown	1
CT 512.01 BG 2	South Kingstown	1
CT 512.02 BG 2	South Kingstown	1
CT 512.02 BG 3	South Kingstown	1
CT 512.02 BG 4	South Kingstown	2
CT 513.02 BG 5	South Kingstown	2
CT 513.02 BG 6	South Kingstown	2
CT 513.05 BG 2	South Kingstown	2
CT 513.06 BG 1	South Kingstown	3
CT 513.06 BG 3	South Kingstown	1
CT 514 BG 1	South Kingstown	1
CT 515.02 BG 2	Narragansett	2
CT 515.03 BG 2	Narragansett	1
CT 515.03 BG 3	Narragansett	2
CT 515.04 BG 1	Narragansett	2
CT 515.04 BG 2	Narragansett	2
CT 515.04 BG 3	Narragansett	2
CT 515.04 BG 4	Narragansett	1

Table G-EJ10. Census Tracts (CT) and Block Groups (BG) in Newport County, Rhode Island (County ID 44-005) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 401.01 BG 1	Portsmouth	1
CT 401.03 BG 3	Portsmouth	2
CT 401.03 BG 4	Portsmouth	3
CT 402 BG 1	Middletown	1
CT 403.02 BG 1	Middletown	3
CT 403.02 BG 2	Middletown	1
CT 403.03 BG 1	Middletown	3
CT 403.03 BG 2	Middletown	1
CT 403.04 BG 1	Middletown	3
CT 403.04 BG 2	Middletown	2
CT 404 BG 2	Middletown	2
CT 404 BG 3	Middletown	2
CT 405 BG 1	Newport	1
CT 405 BG 2	Newport	1
CT 405 BG 3	Newport	1
CT 406 BG 1	Newport	3
CT 406 BG 2	Newport	1
CT 406 BG 3	Newport	2
CT 406 BG 4	Newport	1
CT 407 BG 2	Newport	1
CT 408 BG 1	Newport	1
CT 409 BG 1	Un-named area	2
CT 409 BG 3	Newport	2
CT 410 BG 1	Newport	1
CT 410 BG 2	Newport	2
CT 411 BG 1	Newport	1
CT 411 BG 2	Newport	2
CT 411 BG 3	Newport	2
CT 412 BG 1	Newport	1
CT 413 BG 1	Jamestown	3
CT 413 BG 2	Jamestown	3
CT 416.01 BG 1	Tiverton	2
CT 416.01 BG 2	Tiverton	2

Table G-EJ11. Census Tracts (CT) and Block Groups (BG) in New London County, Connecticut (County ID 09-011) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 6601.02 BG 1	Old Lyme	2
CT 6601.02 BG 4	Old Lyme	3
CT 6903 BG 1	New London	3
CT 6903 BG 2	New London	1
CT 6903 BG 3	New London	1
CT 6903 BG 4	New London	1
CT 6904 BG 1	New London	1
CT 6904 BG 2	New London	1
CT 6905 BG 1	New London	1
CT 6905 BG 2	New London	1
CT 6907 BG 1	New London	1
CT 6908 BG 1	New London	1
CT 6908 BG 2	New London	1
CT 6908 BG 3	New London	1
CT 6909 BG 4	New London	3
CT 6934 BG 1	Waterford	1
CT 6934 BG 2	Waterford	2
CT 6934 BG 3	Waterford	2
CT 6952.01 BG 1	Montville	1
CT 6952.01 BG 2	Montville	2
CT 6961 BG 1	Norwich	2
CT 6961 BG 2	Norwich	1
CT 6961 BG 3	Norwich	1
CT 6961 BG 4	Norwich	3
CT 6962 BG 2	Norwich	3
CT 6963 BG 2	Norwich	2
CT 6964 BG 1	Norwich	1
CT 6964 BG 2	Norwich	1
CT 6964 BG 3	Norwich	1
CT 6964 BG 4	Norwich	1
CT 6964 BG 5	Norwich	1
CT 6965 BG 1	Norwich	3
CT 6965 BG 2	Norwich	1
CT 6965 BG 3	Norwich	1
CT 6966 BG 1	Norwich	3
CT 6966 BG 2	Norwich	3
CT 6967 BG 1	Norwich	1
CT 6967 BG 2	Norwich	1
CT 6967 BG 3	Norwich	1
CT 6968 BG 1	Norwich	1

Census Tract & Block Group ID	Place Name	Category
CT 6968 BG 2	Norwich	1
CT 6970 BG 1	Norwich	1
CT 6970 BG 2	Norwich	1
CT 7001 BG 3	Preston	2
CT 7011 BG 1	Ledyard	3
CT 7011 BG 2	Ledyard	2
CT 7011 BG 3	Ledyard	1
CT 7012 BG 2	Ledyard	2
CT 7021 BG 1	Groton	2
CT 7023 BG 2	Groton	3
CT 7024 BG 1	Groton	3
CT 7024 BG 2	Groton	3
CT 7024 BG 3	Groton	1
CT 7025 BG 1	Groton	1
CT 7025 BG 2	Groton	1
CT 7027 BG 1	Groton	1
CT 7027 BG 2	Groton	3
CT 7027 BG 3	Groton	2
CT 7028 BG 1	Groton	1
CT 7051.02 BG 2	Stonington	2
CT 7051.02 BG 3	Stonington	2
CT 7051.02 BG 4	Stonington	2
CT 7071 BG 1	North Stonington	3
CT 7071 BG 3	North Stonington	2
CT 7081 BG 2	Voluntown	2
CT 7091 BG 2	Griswold	2
CT 7092 BG 1	Griswold	2

Census Tract & Block Group ID	Place Name	Category
CT 7092 BG 2	Griswold	2
CT 7092 BG 3	Griswold	1
CT 7092 BG 4	Griswold	2
CT 7092 BG 5	Griswold	2
CT 7111 BG 2	Sprague	2
CT 7141.01 BG 3	Colchester	2
CT 7141.03 BG 3	Colchester	2
CT 7161.01 BG 1	East Lyme	1
CT 7161.01 BG 3	East Lyme	3
CT 8701 BG 5	Lebanon	2
CT 8702 BG 1	Groton	2
CT 8702 BG 3	Groton	3
CT 8702 BG 4	Groton	1
CT 8703 BG 1	New London	1
CT 8703 BG 2	New London	1
CT 8703 BG 3	New London	2
CT 8703 BG 4	New London	1
CT 8705.01 BG 1	Montville	3
CT 8705.01 BG 2	Montville	3
CT 8705.01 BG 3	Montville	3
CT 8705.02 BG 1	Montville	3
CT 8705.02 BG 2	Montville	2
CT 8707.04 BG 2	East Lyme	2
CT 9800 BG 1	Groton	3

Table G-EJ12. Census Tracts (CT) and Block Groups (BG) in Suffolk County, New York (County ID 36-103) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 1102 BG 2	Huntington	2
CT 1102 BG 5	Huntington	2
CT 1103 BG 3	Huntington	2
CT 1106 BG 3	Huntington	2
CT 1108.03 BG 2	Huntington	2
CT 1109.02 BG 1	Huntington	3
CT 1109.02 BG 2	Huntington	1
CT 1110.01 BG 2	Huntington	2
CT 1110.02 BG 1	Huntington	1
CT 1110.02 BG 3	Huntington	1
CT 1110.02 BG 4	Huntington	1
CT 1111 BG 1	Huntington	1
CT 1111 BG 2	Huntington	3
CT 1111 BG 3	Huntington	1
CT 1111 BG 4	Huntington	1
CT 1111 BG 5	Huntington	2

Census Tract & Block Group ID	Place Name	Category
CT 1112.01 BG 1	Huntington	1
CT 1112.01 BG 2	Huntington	1
CT 1112.02 BG 1	Huntington	1
CT 1112.02 BG 2	Huntington	1
CT 1112.02 BG 3	Huntington	3
CT 1114.02 BG 1	Huntington	2
CT 1115.03 BG 2	Huntington	1
CT 1115.03 BG 3	Huntington	2
CT 1115.05 BG 2	Huntington	1
CT 1115.05 BG 3	Huntington	1
CT 1115.05 BG 4	Huntington	3
CT 1115.06 BG 1	Huntington	3
CT 1115.06 BG 2	Huntington	1
CT 1117.01 BG 1	Huntington	2
CT 1117.01 BG 2	Huntington	2
CT 1117.01 BG 3	Huntington	2

Census Tract & Block Group ID	Place Name	Category
CT 1117.01 BG 4	Huntington	2
CT 1117.04 BG 1	Huntington	2
CT 1118.01 BG 1	Huntington	3
CT 1118.01 BG 4	Huntington	3
CT 1120.01 BG 1	Huntington	2
CT 1120.02 BG 3	Huntington	2
CT 1121.03 BG 2	Huntington	2
CT 1121.03 BG 3	Huntington	2
CT 1121.04 BG 1	Huntington	3
CT 1122.04 BG 3	Huntington	2
CT 1122.1 BG 2	Huntington	1
CT 1122.1 BG 3	Huntington	3
CT 1122.12 BG 1	Huntington	3
CT 1122.13 BG 1	Huntington	3
CT 1122.13 BG 2	Huntington	3
CT 1122.13 BG 3	Huntington	3
CT 1122.14 BG 1	Huntington	1
CT 1122.14 BG 4	Huntington	3
CT 1223 BG 1	Babylon	3
CT 1223 BG 2	Babylon	2
CT 1224.03 BG 1	Babylon	3
CT 1224.03 BG 2	Babylon	3
CT 1224.04 BG 1	Babylon	3
CT 1224.05 BG 1	Babylon	3
CT 1224.05 BG 2	Babylon	3
CT 1224.06 BG 1	Babylon	1
CT 1224.06 BG 2	Babylon	1
CT 1224.06 BG 3	Babylon	1
CT 1225.01 BG 1	Babylon	1
CT 1225.01 BG 2	Babylon	1
CT 1225.01 BG 3	Babylon	1
CT 1225.02 BG 1	Babylon	3
CT 1225.02 BG 2	Babylon	3
CT 1225.02 BG 3	Babylon	3
CT 1226.01 BG 1	Babylon	3
CT 1226.01 BG 3	Babylon	3
CT 1226.02 BG 1	Babylon	1
CT 1226.02 BG 2	Babylon	2
CT 1226.03 BG 1	Babylon	3
CT 1226.03 BG 3	Babylon	2
CT 1226.03 BG 4	Babylon	3
CT 1227.04 BG 1	Babylon	1
CT 1227.04 BG 2	Babylon	3
CT 1227.05 BG 1	Babylon	1
CT 1227.05 BG 2	Babylon	3
CT 1227.06 BG 1	Babylon	2
CT 1227.06 BG 2	Babylon	1
CT 1227.07 BG 1	Babylon	2
CT 1228.01 BG 1	Babylon	1
CT 1228.01 BG 2	Babylon	1
CT 1228.01 BG 4	Babylon	3

Census Tract & Block Group ID	Place Name	Category
CT 1228.02 BG 1	Babylon	3
CT 1228.02 BG 2	Babylon	3
CT 1229.01 BG 2	Babylon	2
CT 1229.01 BG 4	Babylon	3
CT 1229.02 BG 3	Babylon	2
CT 1230.01 BG 2	Babylon	3
CT 1230.01 BG 3	Babylon	2
CT 1230.01 BG 4	Babylon	3
CT 1230.02 BG 2	Babylon	1
CT 1230.02 BG 3	Babylon	1
CT 1231.01 BG 1	Babylon	2
CT 1231.01 BG 2	Babylon	2
CT 1231.02 BG 3	Babylon	3
CT 1232.01 BG 1	Babylon	1
CT 1232.02 BG 1	Babylon	3
CT 1232.02 BG 2	Babylon	1
CT 1232.02 BG 3	Babylon	1
CT 1232.02 BG 4	Babylon	3
CT 1233.01 BG 1	Babylon	1
CT 1233.01 BG 2	Babylon	1
CT 1233.01 BG 3	Babylon	1
CT 1233.01 BG 4	Babylon	1
CT 1233.01 BG 5	Babylon	3
CT 1233.01 BG 6	Babylon	1
CT 1233.02 BG 1	Babylon	1
CT 1234.01 BG 1	Babylon	3
CT 1234.01 BG 2	Babylon	2
CT 1234.01 BG 3	Babylon	2
CT 1234.02 BG 1	Babylon	2
CT 1234.02 BG 2	Babylon	3
CT 1234.02 BG 3	Babylon	2
CT 1234.02 BG 5	Babylon	2
CT 1235 BG 1	Babylon	1
CT 1235 BG 2	Babylon	1
CT 1235 BG 3	Babylon	2
CT 1235 BG 4	Babylon	1
CT 1237.01 BG 1	Babylon	1
CT 1237.01 BG 2	Babylon	1
CT 1237.01 BG 3	Babylon	1
CT 1237.01 BG 4	Babylon	1
CT 1237.02 BG 1	Babylon	1
CT 1237.02 BG 2	Babylon	1
CT 1237.02 BG 3	Babylon	1
CT 1238.01 BG 1	Babylon	2
CT 1238.02 BG 1	Babylon	2
CT 1238.02 BG 2	Babylon	1
CT 1239 BG 1	Babylon	2
CT 1239 BG 2	Babylon	3
CT 1239 BG 3	Babylon	2
CT 1239 BG 5	Babylon	1
CT 1240.01 BG 2	Babylon	2

Census Tract & Block Group ID	Place Name	Category
CT 1240.02 BG 1	Babylon	3
CT 1241.01 BG 1	Babylon	2
CT 1241.01 BG 2	Babylon	1
CT 1241.02 BG 1	Babylon	2
CT 1242 BG 1	Babylon	2
CT 1242 BG 3	Babylon	2
CT 1242 BG 4	Babylon	2
CT 1243 BG 2	Babylon	1
CT 1243 BG 3	Babylon	2
CT 1243 BG 5	Babylon	2
CT 1244.01 BG 1	Babylon	2
CT 1245 BG 3	Babylon	3
CT 1246.01 BG 3	Babylon	2
CT 1246.02 BG 3	Babylon	2
CT 1246.02 BG 4	Babylon	2
CT 1347.02 BG 3	Smithtown	2
CT 1347.02 BG 4	Smithtown	2
CT 1347.03 BG 2	Smithtown	2
CT 1347.04 BG 2	Smithtown	2
CT 1349.02 BG 2	Smithtown	2
CT 1349.04 BG 4	Smithtown	2
CT 1349.06 BG 1	Smithtown	2
CT 1349.06 BG 4	Smithtown	2
CT 1350.03 BG 3	Smithtown	2
CT 1350.05 BG 2	Smithtown	2
CT 1353.01 BG 3	Smithtown	2
CT 1354.02 BG 3	Smithtown	3
CT 1354.03 BG 1	Smithtown	2
CT 1354.03 BG 3	Smithtown	3
CT 1456.02 BG 1	Islip	1
CT 1456.02 BG 2	Islip	1
CT 1456.02 BG 3	Islip	1
CT 1456.03 BG 1	Islip	1
CT 1456.03 BG 2	Islip	1
CT 1456.03 BG 3	Islip	1
CT 1456.04 BG 1	Islip	1
CT 1456.04 BG 2	Islip	1
CT 1456.05 BG 1	Islip	1
CT 1456.05 BG 2	Islip	1
CT 1457.01 BG 1	Islip	2
CT 1457.01 BG 2	Islip	2
CT 1457.01 BG 3	Islip	1
CT 1457.01 BG 4	Islip	2
CT 1457.02 BG 1	Islip	1
CT 1457.02 BG 2	Islip	1
CT 1457.02 BG 3	Islip	1
CT 1457.03 BG 1	Islip	3
CT 1457.03 BG 2	Islip	1
CT 1457.03 BG 3	Islip	1
CT 1457.04 BG 1	Islip	3
CT 1457.04 BG 2	Islip	1

Census Tract & Block Group ID	Place Name	Category
CT 1457.04 BG 3	Islip	1
CT 1457.04 BG 4	Islip	3
CT 1458.03 BG 1	Islip	1
CT 1458.03 BG 2	Islip	2
CT 1458.03 BG 3	Islip	2
CT 1458.04 BG 1	Islip	3
CT 1458.04 BG 2	Islip	1
CT 1458.05 BG 1	Islip	2
CT 1458.05 BG 2	Islip	1
CT 1458.08 BG 2	Islip	2
CT 1459.01 BG 1	Islip	1
CT 1459.01 BG 2	Islip	1
CT 1459.02 BG 1	Islip	1
CT 1459.02 BG 2	Islip	3
CT 1459.02 BG 3	Islip	1
CT 1459.02 BG 4	Islip	1
CT 1459.03 BG 1	Islip	1
CT 1459.03 BG 2	Islip	2
CT 1459.03 BG 3	Islip	3
CT 1459.03 BG 4	Islip	1
CT 1460.01 BG 1	Islip	1
CT 1460.01 BG 2	Islip	1
CT 1460.02 BG 1	Islip	1
CT 1460.02 BG 2	Islip	1
CT 1460.02 BG 3	Islip	1
CT 1460.03 BG 1	Islip	3
CT 1460.03 BG 2	Islip	3
CT 1460.03 BG 3	Islip	1
CT 1460.03 BG 4	Islip	1
CT 1461.02 BG 1	Islip	1
CT 1461.03 BG 2	Islip	1
CT 1461.05 BG 1	Islip	1
CT 1461.05 BG 2	Islip	1
CT 1461.05 BG 3	Islip	1
CT 1461.06 BG 1	Islip	1
CT 1461.06 BG 2	Islip	1
CT 1462.01 BG 1	Islip	1
CT 1462.01 BG 2	Islip	1
CT 1462.02 BG 1	Islip	1
CT 1462.02 BG 2	Islip	1
CT 1462.03 BG 1	Islip	1
CT 1462.03 BG 2	Islip	1
CT 1462.03 BG 3	Islip	1
CT 1462.04 BG 1	Islip	1
CT 1462.04 BG 2	Islip	1
CT 1462.04 BG 3	Islip	1
CT 1462.06 BG 1	Islip	1
CT 1463 BG 1	Islip	1
CT 1463 BG 2	Islip	1
CT 1464.03 BG 1	Islip	1
CT 1464.03 BG 2	Islip	1

Census Tract & Block Group ID	Place Name	Category
CT 1464.03 BG 3	Islip	1
CT 1464.04 BG 1	Islip	1
CT 1464.04 BG 2	Islip	1
CT 1466.04 BG 1	Islip	1
CT 1466.04 BG 2	Islip	2
CT 1466.04 BG 3	Islip	3
CT 1466.06 BG 2	Islip	2
CT 1466.07 BG 1	Islip	2
CT 1466.08 BG 1	Islip	1
CT 1466.13 BG 1	Islip	2
CT 1466.15 BG 3	Islip	3
CT 1467.03 BG 1	Islip	1
CT 1467.03 BG 2	Islip	3
CT 1467.04 BG 1	Islip	2
CT 1468 BG 1	Islip	2
CT 1468 BG 4	Islip	2
CT 1469.01 BG 3	Islip	2
CT 1469.01 BG 4	Islip	2
CT 1469.02 BG 2	Islip	2
CT 1472 BG 1	Islip	1
CT 1472 BG 2	Islip	1
CT 1472 BG 4	Islip	1
CT 1472 BG 5	Islip	1
CT 1473 BG 1	Islip	1
CT 1473 BG 2	Islip	3
CT 1473 BG 3	Islip	3
CT 1473 BG 4	Islip	3
CT 1473 BG 5	Islip	1
CT 1474.01 BG 4	Islip	1
CT 1475.01 BG 2	Islip	2
CT 1475.01 BG 5	Islip	2
CT 1476.02 BG 3	Islip	2
CT 1477.01 BG 2	Islip	2
CT 1477.02 BG 4	Islip	2
CT 1478.02 BG 1	Islip	2
CT 1479.01 BG 2	Islip	2
CT 1479.01 BG 3	Islip	2
CT 1479.02 BG 1	Islip	2
CT 1580.02 BG 3	Brookhaven	2
CT 1580.02 BG 4	Brookhaven	2
CT 1580.07 BG 1	Brookhaven	3
CT 1580.07 BG 2	Brookhaven	1
CT 1580.07 BG 3	Brookhaven	3
CT 1580.07 BG 4	Brookhaven	3
CT 1580.11 BG 3	Brookhaven	2
CT 1581.02 BG 2	Brookhaven	3
CT 1581.03 BG 1	Brookhaven	1
CT 1581.03 BG 2	Brookhaven	2
CT 1581.07 BG 1	Brookhaven	2
CT 1581.08 BG 1	Brookhaven	3
CT 1581.11 BG 2	Brookhaven	1
CT 1581.12 BG 1	Brookhaven	3
CT 1581.12 BG 2	Brookhaven	2
CT 1581.15 BG 3	Brookhaven	2
CT 1581.16 BG 1	Brookhaven	3
CT 1581.16 BG 2	Brookhaven	3
CT 1582.02 BG 2	Brookhaven	1
CT 1582.02 BG 5	Brookhaven	2
CT 1582.06 BG 2	Brookhaven	2
CT 1583.04 BG 2	Brookhaven	1
CT 1583.06 BG 2	Brookhaven	2
CT 1583.08 BG 1	Brookhaven	2
CT 1583.08 BG 2	Brookhaven	1
CT 1583.08 BG 4	Brookhaven	1
CT 1583.09 BG 1	Brookhaven	1
CT 1583.09 BG 2	Brookhaven	1
CT 1583.1 BG 1	Brookhaven	2
CT 1583.1 BG 2	Brookhaven	2
CT 1583.15 BG 1	Brookhaven	3
CT 1583.15 BG 2	Brookhaven	2
CT 1583.19 BG 2	Brookhaven	1
CT 1583.19 BG 3	Brookhaven	3
CT 1583.2 BG 4	Brookhaven	3
CT 1583.21 BG 1	Brookhaven	1
CT 1583.21 BG 3	Brookhaven	3
CT 1583.21 BG 4	Brookhaven	3
CT 1583.23 BG 2	Brookhaven	2
CT 1584.01 BG 1	Brookhaven	2
CT 1584.02 BG 2	Brookhaven	2
CT 1584.03 BG 1	Brookhaven	2
CT 1584.03 BG 2	Brookhaven	2
CT 1584.05 BG 2	Brookhaven	2
CT 1584.07 BG 2	Brookhaven	2
CT 1584.07 BG 4	Brookhaven	1
CT 1584.09 BG 1	Brookhaven	1
CT 1584.09 BG 2	Brookhaven	2
CT 1584.1 BG 2	Brookhaven	2
CT 1584.1 BG 3	Brookhaven	2
CT 1585.02 BG 2	Brookhaven	2
CT 1585.02 BG 3	Brookhaven	2
CT 1585.05 BG 3	Brookhaven	1
CT 1585.07 BG 1	Brookhaven	3
CT 1585.07 BG 2	Brookhaven	2
CT 1585.08 BG 1	Brookhaven	3
CT 1585.09 BG 1	Brookhaven	2
CT 1585.09 BG 2	Brookhaven	3
CT 1585.09 BG 3	Brookhaven	2
CT 1585.1 BG 2	Brookhaven	2
CT 1585.1 BG 3	Brookhaven	2
CT 1585.1 BG 4	Brookhaven	2
CT 1585.11 BG 3	Brookhaven	1
CT 1586.04 BG 1	Brookhaven	2

Census Tract & Block Group ID	Place Name	Category
CT 1586.04 BG 2	Brookhaven	1
CT 1586.05 BG 2	Brookhaven	3
CT 1586.07 BG 1	Brookhaven	3
CT 1586.07 BG 2	Brookhaven	2
CT 1586.08 BG 1	Brookhaven	2
CT 1586.08 BG 2	Brookhaven	3
CT 1586.08 BG 3	Brookhaven	2
CT 1586.09 BG 3	Brookhaven	3
CT 1587.04 BG 1	Brookhaven	2
CT 1587.04 BG 2	Brookhaven	2
CT 1587.04 BG 3	Brookhaven	2
CT 1587.04 BG 4	Brookhaven	1
CT 1587.05 BG 1	Brookhaven	1
CT 1587.05 BG 2	Brookhaven	1
CT 1587.05 BG 3	Brookhaven	1
CT 1587.08 BG 1	Brookhaven	2
CT 1587.08 BG 2	Brookhaven	1
CT 1587.08 BG 3	Brookhaven	1
CT 1587.1 BG 1	Brookhaven	1
CT 1587.1 BG 3	Brookhaven	2
CT 1587.1 BG 4	Brookhaven	3
CT 1587.11 BG 2	Brookhaven	2
CT 1587.11 BG 3	Brookhaven	1
CT 1587.12 BG 1	Brookhaven	3
CT 1587.12 BG 2	Brookhaven	1
CT 1587.12 BG 5	Brookhaven	2
CT 1588.02 BG 3	Brookhaven	2
CT 1588.03 BG 3	Brookhaven	3
CT 1588.04 BG 1	Brookhaven	1
CT 1588.04 BG 2	Brookhaven	3
CT 1588.04 BG 3	Brookhaven	2
CT 1588.04 BG 4	Brookhaven	2
CT 1588.04 BG 5	Brookhaven	2
CT 1589 BG 1	Brookhaven	2
CT 1589 BG 2	Brookhaven	1
CT 1589 BG 4	Brookhaven	1
CT 1589 BG 5	Brookhaven	1
CT 1590 BG 1	Brookhaven	1
CT 1590 BG 2	Brookhaven	1
CT 1590 BG 3	Brookhaven	2
CT 1591.02 BG 1	Brookhaven	1
CT 1591.02 BG 3	Brookhaven	1
CT 1591.02 BG 4	Brookhaven	1
CT 1591.02 BG 5	Brookhaven	2
CT 1591.03 BG 1	Brookhaven	1
CT 1591.03 BG 2	Brookhaven	1
CT 1591.03 BG 3	Brookhaven	1
CT 1591.03 BG 4	Brookhaven	1
CT 1591.05 BG 2	Brookhaven	1
CT 1591.05 BG 3	Brookhaven	1
CT 1591.05 BG 4	Brookhaven	2

Census Tract & Block Group ID	Place Name	Category
CT 1591.06 BG 1	Brookhaven	1
CT 1591.06 BG 2	Brookhaven	1
CT 1591.06 BG 3	Brookhaven	3
CT 1591.07 BG 1	Brookhaven	2
CT 1591.07 BG 3	Brookhaven	2
CT 1591.08 BG 1	Brookhaven	3
CT 1591.08 BG 2	Brookhaven	3
CT 1591.08 BG 3	Brookhaven	2
CT 1591.08 BG 5	Brookhaven	3
CT 1592.01 BG 1	Brookhaven	2
CT 1592.01 BG 2	Brookhaven	2
CT 1592.03 BG 3	Brookhaven	2
CT 1592.04 BG 1	Brookhaven	1
CT 1592.04 BG 3	Brookhaven	2
CT 1594.04 BG 1	Brookhaven	1
CT 1594.04 BG 2	Brookhaven	2
CT 1594.04 BG 3	Brookhaven	1
CT 1594.04 BG 4	Brookhaven	1
CT 1594.04 BG 5	Brookhaven	1
CT 1594.06 BG 3	Brookhaven	1
CT 1594.07 BG 2	Brookhaven	2
CT 1594.08 BG 1	Brookhaven	1
CT 1594.1 BG 1	Brookhaven	2
CT 1594.1 BG 2	Brookhaven	1
CT 1594.11 BG 2	Brookhaven	2
CT 1594.12 BG 2	Brookhaven	2
CT 1594.12 BG 4	Brookhaven	2
CT 1595.05 BG 1	Brookhaven	2
CT 1595.05 BG 2	Brookhaven	1
CT 1595.05 BG 3	Brookhaven	2
CT 1595.05 BG 4	Brookhaven	2
CT 1595.05 BG 5	Brookhaven	3
CT 1595.06 BG 1	Brookhaven	1
CT 1595.06 BG 2	Brookhaven	1
CT 1595.06 BG 3	Brookhaven	1
CT 1595.06 BG 4	Brookhaven	1
CT 1595.08 BG 1	Brookhaven	2
CT 1595.08 BG 3	Brookhaven	2
CT 1595.08 BG 4	Brookhaven	1
CT 1595.09 BG 1	Brookhaven	2
CT 1595.09 BG 2	Brookhaven	2
CT 1595.09 BG 3	Brookhaven	1
CT 1595.1 BG 1	Brookhaven	1
CT 1595.1 BG 2	Brookhaven	2
CT 1595.11 BG 1	Brookhaven	1
CT 1595.11 BG 2	Brookhaven	1
CT 1595.11 BG 3	Brookhaven	1
CT 1595.12 BG 1	Brookhaven	2
CT 1596.01 BG 4	Brookhaven	2
CT 1596.02 BG 2	Brookhaven	2
CT 1697.01 BG 3	Riverhead	2

Census Tract & Block Group ID	Place Name	Category
CT 1697.04 BG 1	Riverhead	2
CT 1697.04 BG 2	Riverhead	3
CT 1697.04 BG 3	Riverhead	1
CT 1697.04 BG 4	Riverhead	2
CT 1697.04 BG 5	Riverhead	2
CT 1697.04 BG 6	Riverhead	2
CT 1698 BG 1	Riverhead	1
CT 1698 BG 2	Riverhead	1
CT 1698 BG 3	Riverhead	1
CT 1698 BG 4	Riverhead	1
CT 1699.01 BG 1	Riverhead	2
CT 1699.01 BG 2	Riverhead	1
CT 1699.02 BG 3	Riverhead	2
CT 1700.02 BG 4	Southold	2
CT 1701.01 BG 1	Southold	1
CT 1701.01 BG 2	Southold	2
CT 1702.01 BG 2	Southold	2
CT 1702.01 BG 3	Southold	1
CT 1702.02 BG 5	Southold	2
CT 1904.01 BG 1	Southampton	3
CT 1904.01 BG 2	Southampton	1
CT 1904.01 BG 3	Southampton	2
CT 1904.01 BG 4	Southampton	1
CT 1904.01 BG 5	Southampton	2
CT 1904.01 BG 6	Southampton	1
CT 1904.01 BG 7	Southampton	1
CT 1904.02 BG 1	Southampton	1
CT 1904.03 BG 2	Southampton	1
CT 1904.03 BG 3	Southampton	1
CT 1905.02 BG 1	Southampton	1
CT 1905.02 BG 3	Southampton	2
CT 1905.03 BG 2	Southampton	2
CT 1905.03 BG 4	Southampton	2
CT 1906.01 BG 2	Southampton	2
CT 1906.01 BG 4	Southampton	1

Census Tract & Block Group ID	Place Name	Category
CT 1906.03 BG 1	Southampton	1
CT 1906.03 BG 2	Southampton	1
CT 1906.03 BG 3	Southampton	1
CT 1906.04 BG 2	Southampton	2
CT 1907.04 BG 1	Southampton	1
CT 1907.04 BG 3	Southampton	2
CT 1907.04 BG 4	Southampton	1
CT 1907.04 BG 5	Southampton	2
CT 1907.05 BG 1	Shinnecock Reservation	1
CT 1907.05 BG 2	Southampton	1
CT 1907.05 BG 3	Southampton	1
CT 1907.05 BG 4	Southampton	1
CT 1907.06 BG 1	Southampton	2
CT 1907.06 BG 5	Southampton	1
CT 1907.07 BG 2	Southampton	2
CT 1907.07 BG 4	Southampton	3
CT 1908 BG 2	Southampton	1
CT 2009.01 BG 2	East Hampton	2
CT 2009.02 BG 2	East Hampton	1
CT 2009.02 BG 3	East Hampton	3
CT 2009.02 BG 4	East Hampton	2
CT 2009.02 BG 7	East Hampton	2
CT 2010.01 BG 2	East Hampton	2
CT 2010.01 BG 4	East Hampton	1
CT 2010.01 BG 5	East Hampton	1
CT 2010.03 BG 1	East Hampton	1
CT 2010.03 BG 4	East Hampton	2
CT 2010.03 BG 5	East Hampton	3
CT 2010.04 BG 2	East Hampton	3
CT 2010.04 BG 4	East Hampton	3
CT 2011 BG 1	Islip	1
CT 2011 BG 2	Islip	1
CT 2011 BG 3	Islip	1
CT 2011 BG 4	Islip	1

Table G-EJ13. Census Tracts (CT) and Block Groups (BG) in New York County, New York (County ID 36-061) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 10.02 BG 1	Manhattan	1
CT 10.02 BG 2	Manhattan	1
CT 10.02 BG 3	Manhattan	1
CT 101 BG 1	Manhattan	3
CT 110 BG 6	Manhattan	2
CT 111 BG 1	Manhattan	3
CT 111 BG 2	Manhattan	2

Census Tract & Block Group ID	Place Name	Category
CT 113 BG 1	Manhattan	1
CT 115 BG 1	Manhattan	3
CT 115 BG 2	Manhattan	1
CT 117 BG 1	Manhattan	3
CT 118 BG 5	Manhattan	2
CT 119 BG 1	Manhattan	1
CT 119 BG 2	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 12 BG 1	Manhattan	1
CT 12 BG 2	Manhattan	2
CT 121 BG 2	Manhattan	2
CT 121 BG 6	Manhattan	1
CT 124 BG 6	Manhattan	1
CT 125 BG 2	Manhattan	3
CT 127 BG 1	Manhattan	2
CT 127 BG 2	Manhattan	3
CT 127 BG 3	Manhattan	1
CT 129 BG 1	Manhattan	2
CT 131 BG 1	Manhattan	1
CT 132 BG 3	Manhattan	3
CT 132 BG 5	Manhattan	3
CT 132 BG 7	Manhattan	3
CT 133 BG 1	Manhattan	2
CT 133 BG 2	Manhattan	1
CT 133 BG 4	Manhattan	3
CT 133 BG 5	Manhattan	3
CT 134 BG 3	Manhattan	2
CT 134 BG 9	Manhattan	1
CT 135 BG 1	Manhattan	1
CT 135 BG 2	Manhattan	1
CT 137 BG 2	Manhattan	2
CT 137 BG 5	Manhattan	3
CT 139 BG 2	Manhattan	3
CT 139 BG 3	Manhattan	1
CT 139 BG 5	Manhattan	1
CT 14.02 BG 1	Manhattan	1
CT 14.02 BG 2	Manhattan	1
CT 143 BG 1	Manhattan	1
CT 145 BG 2	Manhattan	3
CT 146.02 BG 4	Manhattan	2
CT 149 BG 4	Manhattan	2
CT 15.01 BG 3	Manhattan	2
CT 151 BG 1	Manhattan	1
CT 151 BG 2	Manhattan	1
CT 151 BG 3	Manhattan	1
CT 152 BG 1	Manhattan	1
CT 152 BG 2	Manhattan	1
CT 152 BG 3	Manhattan	3
CT 154 BG 9	Manhattan	3
CT 156.01 BG 2	Manhattan	1
CT 156.02 BG 1	Manhattan	1
CT 16 BG 1	Manhattan	1
CT 16 BG 2	Manhattan	1
CT 16 BG 3	Manhattan	1
CT 16 BG 4	Manhattan	1
CT 16 BG 5	Manhattan	1
CT 162 BG 1	Manhattan	1
CT 162 BG 2	Manhattan	1
CT 162 BG 3	Manhattan	1
CT 162 BG 4	Manhattan	1
CT 162 BG 5	Manhattan	1
CT 164 BG 1	Manhattan	1
CT 164 BG 2	Manhattan	1
CT 164 BG 3	Manhattan	1
CT 164 BG 4	Manhattan	1
CT 166 BG 1	Manhattan	1
CT 166 BG 2	Manhattan	1
CT 166 BG 3	Manhattan	1
CT 166 BG 4	Manhattan	1
CT 166 BG 5	Manhattan	1
CT 166 BG 6	Manhattan	1
CT 168 BG 1	Manhattan	1
CT 168 BG 2	Manhattan	1
CT 168 BG 3	Manhattan	1
CT 169 BG 4	Manhattan	2
CT 170 BG 1	Manhattan	1
CT 170 BG 2	Manhattan	1
CT 170 BG 3	Manhattan	1
CT 170 BG 4	Manhattan	3
CT 170 BG 5	Manhattan	1
CT 172 BG 1	Manhattan	1
CT 172 BG 2	Manhattan	1
CT 172 BG 3	Manhattan	1
CT 172 BG 4	Manhattan	1
CT 172 BG 5	Manhattan	1
CT 173 BG 2	Manhattan	1
CT 173 BG 4	Manhattan	3
CT 174.01 BG 1	Manhattan	1
CT 174.01 BG 2	Manhattan	1
CT 174.01 BG 3	Manhattan	3
CT 174.02 BG 1	Manhattan	1
CT 175 BG 3	Manhattan	2
CT 177 BG 1	Manhattan	1
CT 177 BG 2	Manhattan	3
CT 177 BG 4	Manhattan	1
CT 177 BG 7	Manhattan	1
CT 178 BG 1	Manhattan	1
CT 178 BG 2	Manhattan	1
CT 178 BG 3	Manhattan	1
CT 179 BG 6	Manhattan	1
CT 18 BG 1	Manhattan	1
CT 18 BG 2	Manhattan	1
CT 18 BG 3	Manhattan	3
CT 18 BG 4	Manhattan	1
CT 18 BG 5	Manhattan	1
CT 18 BG 6	Manhattan	1
CT 18 BG 7	Manhattan	1
CT 180 BG 1	Manhattan	1
CT 180 BG 2	Manhattan	1
CT 180 BG 3	Manhattan	1
CT 180 BG 4	Manhattan	1
CT 181 BG 4	Manhattan	3
CT 182 BG 1	Manhattan	1
CT 182 BG 2	Manhattan	1
CT 182 BG 3	Manhattan	1
CT 182 BG 4	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 182 BG 5	Manhattan	1
CT 184 BG 1	Manhattan	1
CT 184 BG 2	Manhattan	1
CT 184 BG 3	Manhattan	1
CT 184 BG 4	Manhattan	1
CT 186 BG 1	Manhattan	1
CT 186 BG 2	Manhattan	1
CT 186 BG 3	Manhattan	1
CT 187 BG 5	Manhattan	1
CT 188 BG 1	Manhattan	1
CT 188 BG 2	Manhattan	1
CT 188 BG 3	Manhattan	1
CT 188 BG 4	Manhattan	1
CT 189 BG 2	Manhattan	3
CT 189 BG 3	Manhattan	1
CT 189 BG 4	Manhattan	1
CT 189 BG 5	Manhattan	1
CT 189 BG 6	Manhattan	1
CT 190 BG 1	Manhattan	1
CT 191 BG 3	Manhattan	2
CT 191 BG 5	Manhattan	3
CT 191 BG 6	Manhattan	1
CT 192 BG 1	Manhattan	1
CT 192 BG 2	Manhattan	1
CT 192 BG 3	Manhattan	1
CT 193 BG 1	Manhattan	3
CT 193 BG 2	Manhattan	1
CT 193 BG 3	Manhattan	1
CT 193 BG 4	Manhattan	1
CT 193 BG 5	Manhattan	1
CT 193 BG 6	Manhattan	1
CT 194 BG 1	Manhattan	1
CT 194 BG 2	Manhattan	3
CT 194 BG 3	Manhattan	1
CT 194 BG 4	Manhattan	1
CT 195 BG 3	Manhattan	2
CT 195 BG 4	Manhattan	1
CT 195 BG 5	Manhattan	2
CT 196 BG 1	Manhattan	1
CT 196 BG 2	Manhattan	1
CT 196 BG 3	Manhattan	1
CT 197.01 BG 1	Manhattan	1
CT 197.02 BG 1	Manhattan	1
CT 198 BG 1	Manhattan	3
CT 199 BG 3	Manhattan	2
CT 199 BG 5	Manhattan	2
CT 2.01 BG 1	Manhattan	1
CT 2.01 BG 2	Manhattan	1
CT 2.02 BG 1	Manhattan	1
CT 2.02 BG 2	Manhattan	1
CT 2.02 BG 3	Manhattan	1
CT 2.02 BG 4	Manhattan	1
CT 2.02 BG 5	Manhattan	1
CT 20 BG 1	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 20 BG 2	Manhattan	1
CT 20 BG 3	Manhattan	1
CT 200 BG 1	Manhattan	3
CT 200 BG 2	Manhattan	3
CT 201.02 BG 1	Manhattan	1
CT 201.02 BG 2	Manhattan	1
CT 201.02 BG 3	Manhattan	3
CT 201.02 BG 4	Manhattan	3
CT 203 BG 1	Manhattan	1
CT 206 BG 1	Manhattan	1
CT 206 BG 2	Manhattan	1
CT 207.01 BG 1	Manhattan	1
CT 207.01 BG 2	Manhattan	3
CT 208 BG 1	Manhattan	1
CT 208 BG 2	Manhattan	3
CT 208 BG 3	Manhattan	3
CT 209.01 BG 1	Manhattan	1
CT 209.01 BG 2	Manhattan	1
CT 210 BG 1	Manhattan	1
CT 210 BG 2	Manhattan	1
CT 210 BG 3	Manhattan	1
CT 210 BG 4	Manhattan	1
CT 211 BG 1	Manhattan	1
CT 211 BG 3	Manhattan	1
CT 211 BG 4	Manhattan	1
CT 211 BG 5	Manhattan	1
CT 211 BG 6	Manhattan	3
CT 211 BG 7	Manhattan	1
CT 212 BG 1	Manhattan	1
CT 212 BG 2	Manhattan	3
CT 212 BG 3	Manhattan	3
CT 212 BG 4	Manhattan	3
CT 213.03 BG 1	Manhattan	1
CT 213.03 BG 2	Manhattan	1
CT 213.03 BG 3	Manhattan	1
CT 213.03 BG 4	Manhattan	1
CT 214 BG 1	Manhattan	1
CT 214 BG 2	Manhattan	3
CT 215 BG 1	Manhattan	1
CT 215 BG 2	Manhattan	1
CT 216 BG 1	Manhattan	3
CT 216 BG 2	Manhattan	1
CT 216 BG 3	Manhattan	1
CT 216 BG 4	Manhattan	3
CT 216 BG 5	Manhattan	1
CT 218 BG 1	Manhattan	3
CT 218 BG 2	Manhattan	1
CT 218 BG 3	Manhattan	1
CT 218 BG 4	Manhattan	1
CT 219 BG 1	Manhattan	1
CT 219 BG 2	Manhattan	1
CT 219 BG 3	Manhattan	1
CT 219 BG 4	Manhattan	1
CT 22.01 BG 1	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 22.01 BG 2	Manhattan	1
CT 22.01 BG 3	Manhattan	1
CT 22.01 BG 4	Manhattan	1
CT 22.02 BG 1	Manhattan	2
CT 220 BG 1	Manhattan	1
CT 220 BG 2	Manhattan	1
CT 220 BG 3	Manhattan	1
CT 220 BG 4	Manhattan	3
CT 220 BG 5	Manhattan	1
CT 221.02 BG 1	Manhattan	1
CT 221.02 BG 2	Manhattan	3
CT 222 BG 1	Manhattan	1
CT 222 BG 2	Manhattan	1
CT 223.01 BG 1	Manhattan	1
CT 223.01 BG 2	Manhattan	1
CT 223.01 BG 3	Manhattan	1
CT 223.01 BG 4	Manhattan	1
CT 223.02 BG 1	Manhattan	1
CT 224 BG 1	Manhattan	1
CT 224 BG 2	Manhattan	1
CT 224 BG 3	Manhattan	1
CT 224 BG 4	Manhattan	1
CT 225 BG 1	Manhattan	1
CT 225 BG 2	Manhattan	1
CT 225 BG 3	Manhattan	1
CT 225 BG 4	Manhattan	1
CT 225 BG 5	Manhattan	1
CT 226 BG 1	Manhattan	1
CT 226 BG 2	Manhattan	1
CT 226 BG 3	Manhattan	1
CT 227 BG 1	Manhattan	1
CT 227 BG 2	Manhattan	1
CT 227 BG 3	Manhattan	1
CT 228 BG 1	Manhattan	1
CT 228 BG 2	Manhattan	1
CT 228 BG 3	Manhattan	3
CT 228 BG 4	Manhattan	3
CT 229 BG 1	Manhattan	1
CT 229 BG 2	Manhattan	1
CT 229 BG 3	Manhattan	1
CT 229 BG 4	Manhattan	1
CT 229 BG 5	Manhattan	1
CT 230 BG 1	Manhattan	1
CT 230 BG 2	Manhattan	1
CT 230 BG 3	Manhattan	1
CT 230 BG 4	Manhattan	1
CT 230 BG 5	Manhattan	1
CT 231 BG 1	Manhattan	1
CT 231 BG 2	Manhattan	1
CT 231 BG 3	Manhattan	1
CT 232 BG 1	Manhattan	1
CT 232 BG 2	Manhattan	1
CT 232 BG 3	Manhattan	1
CT 232 BG 4	Manhattan	1
CT 233 BG 1	Manhattan	1
CT 233 BG 2	Manhattan	1
CT 233 BG 3	Manhattan	1
CT 234 BG 1	Manhattan	1
CT 234 BG 2	Manhattan	1
CT 235.01 BG 1	Manhattan	1
CT 235.01 BG 2	Manhattan	1
CT 235.01 BG 3	Manhattan	1
CT 235.01 BG 4	Manhattan	1
CT 235.02 BG 1	Manhattan	1
CT 236 BG 1	Manhattan	1
CT 236 BG 2	Manhattan	3
CT 236 BG 3	Manhattan	1
CT 236 BG 4	Manhattan	1
CT 237 BG 1	Manhattan	1
CT 237 BG 2	Manhattan	1
CT 237 BG 3	Manhattan	1
CT 238.01 BG 1	Manhattan	3
CT 238.02 BG 1	Manhattan	3
CT 238.02 BG 2	Manhattan	1
CT 239 BG 1	Manhattan	1
CT 239 BG 2	Manhattan	1
CT 24 BG 1	Manhattan	1
CT 24 BG 2	Manhattan	1
CT 240 BG 1	Manhattan	1
CT 241 BG 1	Manhattan	3
CT 241 BG 2	Manhattan	3
CT 241 BG 3	Manhattan	1
CT 241 BG 4	Manhattan	3
CT 241 BG 5	Manhattan	1
CT 242 BG 1	Manhattan	1
CT 242 BG 2	Manhattan	1
CT 242 BG 3	Manhattan	1
CT 243.01 BG 1	Manhattan	1
CT 243.01 BG 2	Manhattan	1
CT 243.01 BG 3	Manhattan	1
CT 243.02 BG 1	Manhattan	1
CT 243.02 BG 2	Manhattan	1
CT 243.02 BG 3	Manhattan	1
CT 245 BG 1	Manhattan	1
CT 245 BG 2	Manhattan	3
CT 245 BG 3	Manhattan	3
CT 245 BG 4	Manhattan	1
CT 245 BG 5	Manhattan	1
CT 245 BG 6	Manhattan	1
CT 245 BG 7	Manhattan	1
CT 247 BG 1	Manhattan	3
CT 247 BG 2	Manhattan	1
CT 247 BG 3	Manhattan	1
CT 247 BG 4	Manhattan	1
CT 247 BG 5	Manhattan	1
CT 249 BG 1	Manhattan	1
CT 25 BG 1	Manhattan	1
CT 25 BG 2	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 25 BG 3	Manhattan	1
CT 251 BG 1	Manhattan	1
CT 251 BG 2	Manhattan	1
CT 253 BG 1	Manhattan	1
CT 253 BG 2	Manhattan	1
CT 253 BG 3	Manhattan	1
CT 253 BG 4	Manhattan	1
CT 253 BG 5	Manhattan	1
CT 253 BG 6	Manhattan	1
CT 255 BG 1	Manhattan	1
CT 255 BG 2	Manhattan	1
CT 255 BG 3	Manhattan	1
CT 255 BG 4	Manhattan	3
CT 257 BG 1	Manhattan	1
CT 257 BG 2	Manhattan	3
CT 257 BG 3	Manhattan	3
CT 259 BG 1	Manhattan	1
CT 259 BG 2	Manhattan	1
CT 26.01 BG 1	Manhattan	1
CT 26.01 BG 2	Manhattan	1
CT 26.02 BG 1	Manhattan	1
CT 26.02 BG 2	Manhattan	2
CT 261 BG 1	Manhattan	1
CT 261 BG 2	Manhattan	1
CT 261 BG 3	Manhattan	1
CT 261 BG 4	Manhattan	1
CT 261 BG 5	Manhattan	1
CT 261 BG 6	Manhattan	3
CT 261 BG 7	Manhattan	1
CT 263 BG 1	Manhattan	1
CT 263 BG 2	Manhattan	1
CT 263 BG 3	Manhattan	1
CT 263 BG 4	Manhattan	1
CT 263 BG 5	Manhattan	1
CT 265 BG 1	Manhattan	1
CT 265 BG 2	Manhattan	1
CT 265 BG 3	Manhattan	3
CT 265 BG 4	Manhattan	3
CT 265 BG 5	Manhattan	1
CT 267 BG 1	Manhattan	2
CT 269 BG 1	Manhattan	1
CT 269 BG 2	Manhattan	1
CT 269 BG 3	Manhattan	3
CT 269 BG 4	Manhattan	1
CT 269 BG 5	Manhattan	1
CT 269 BG 6	Manhattan	1
CT 27 BG 1	Manhattan	1
CT 271 BG 1	Manhattan	1
CT 271 BG 2	Manhattan	1
CT 271 BG 3	Manhattan	1
CT 271 BG 4	Manhattan	1
CT 271 BG 5	Manhattan	2
CT 277 BG 1	Manhattan	1
CT 277 BG 2	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 277 BG 3	Manhattan	1
CT 277 BG 4	Manhattan	1
CT 279 BG 1	Manhattan	2
CT 279 BG 2	Manhattan	1
CT 279 BG 3	Manhattan	1
CT 279 BG 4	Manhattan	1
CT 279 BG 5	Manhattan	3
CT 279 BG 6	Manhattan	1
CT 279 BG 7	Manhattan	1
CT 28 BG 1	Manhattan	1
CT 28 BG 2	Manhattan	1
CT 28 BG 3	Manhattan	1
CT 28 BG 4	Manhattan	1
CT 283 BG 1	Manhattan	3
CT 283 BG 2	Manhattan	3
CT 283 BG 3	Manhattan	1
CT 283 BG 4	Manhattan	1
CT 285 BG 1	Manhattan	1
CT 285 BG 2	Manhattan	1
CT 285 BG 3	Manhattan	1
CT 285 BG 4	Manhattan	1
CT 287 BG 2	Manhattan	1
CT 287 BG 3	Manhattan	1
CT 29 BG 1	Manhattan	1
CT 29 BG 2	Manhattan	1
CT 29 BG 3	Manhattan	1
CT 29 BG 4	Manhattan	1
CT 291 BG 1	Manhattan	1
CT 291 BG 2	Manhattan	1
CT 291 BG 3	Manhattan	1
CT 291 BG 4	Manhattan	1
CT 291 BG 5	Manhattan	1
CT 291 BG 6	Manhattan	1
CT 291 BG 7	Manhattan	1
CT 293 BG 1	Manhattan	1
CT 293 BG 2	Manhattan	1
CT 293 BG 3	Manhattan	1
CT 293 BG 4	Manhattan	1
CT 293 BG 5	Manhattan	1
CT 295 BG 2	Manhattan	1
CT 295 BG 3	Manhattan	1
CT 295 BG 4	Manhattan	3
CT 297 BG 1	Manhattan	3
CT 299 BG 1	Manhattan	1
CT 299 BG 2	Manhattan	1
CT 30.01 BG 2	Manhattan	2
CT 30.01 BG 3	Manhattan	1
CT 30.01 BG 4	Manhattan	3
CT 30.02 BG 2	Manhattan	1
CT 303 BG 1	Manhattan	1
CT 303 BG 2	Manhattan	1
CT 307 BG 1	Manhattan	3
CT 307 BG 3	Manhattan	2
CT 309 BG 1	Manhattan	1

Census Tract & Block Group ID	Place Name	Category
CT 309 BG 2	Manhattan	1
CT 309 BG 3	Manhattan	1
CT 309 BG 4	Manhattan	3
CT 32 BG 3	Manhattan	2
CT 32 BG 5	Manhattan	2
CT 34 BG 1	Manhattan	2
CT 34 BG 2	Manhattan	1
CT 34 BG 3	Manhattan	2
CT 34 BG 4	Manhattan	2
CT 36.01 BG 1	Manhattan	1
CT 36.01 BG 2	Manhattan	3
CT 36.01 BG 3	Manhattan	1
CT 36.02 BG 2	Manhattan	1
CT 38 BG 1	Manhattan	2
CT 38 BG 3	Manhattan	3
CT 40 BG 4	Manhattan	1
CT 41 BG 2	Manhattan	3
CT 41 BG 3	Manhattan	1
CT 41 BG 4	Manhattan	1
CT 41 BG 5	Manhattan	1
CT 41 BG 6	Manhattan	1
CT 43 BG 2	Manhattan	1
CT 48 BG 5	Manhattan	3
CT 48 BG 6	Manhattan	2
CT 56 BG 1	Manhattan	2
CT 6 BG 1	Manhattan	1
CT 6 BG 2	Manhattan	1
CT 6 BG 3	Manhattan	1
CT 6 BG 4	Manhattan	1
CT 6 BG 5	Manhattan	1
CT 6 BG 6	Manhattan	1
CT 62 BG 1	Manhattan	1
CT 62 BG 2	Manhattan	3

Census Tract & Block Group ID	Place Name	Category
CT 64 BG 4	Manhattan	2
CT 64 BG 5	Manhattan	3
CT 64 BG 6	Manhattan	2
CT 66 BG 2	Manhattan	1
CT 66 BG 7	Manhattan	1
CT 66 BG 8	Manhattan	2
CT 66 BG 9	Manhattan	1
CT 68 BG 4	Manhattan	2
CT 68 BG 5	Manhattan	3
CT 72 BG 2	Manhattan	2
CT 72 BG 4	Manhattan	2
CT 74 BG 1	Manhattan	3
CT 76 BG 1	Manhattan	3
CT 78 BG 6	Manhattan	3
CT 78 BG 7	Manhattan	2
CT 8 BG 1	Manhattan	1
CT 8 BG 2	Manhattan	1
CT 8 BG 3	Manhattan	1
CT 8 BG 4	Manhattan	1
CT 8 BG 5	Manhattan	1
CT 8 BG 6	Manhattan	1
CT 81 BG 2	Manhattan	2
CT 83 BG 3	Manhattan	1
CT 84 BG 2	Manhattan	3
CT 88 BG 5	Manhattan	1
CT 89 BG 3	Manhattan	1
CT 91 BG 3	Manhattan	2
CT 93 BG 1	Manhattan	2
CT 93 BG 6	Manhattan	1
CT 97 BG 2	Manhattan	1
CT 97 BG 3	Manhattan	3
CT 97 BG 4	Manhattan	1

Table G-EJ14. Census Tracts (CT) and Block Groups (BG) in Kings County, New York (County ID 36-047) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 100 BG 1	Brooklyn	1
CT 100 BG 2	Brooklyn	1
CT 100 BG 3	Brooklyn	1
CT 100 BG 4	Brooklyn	1
CT 1004 BG 1	Brooklyn	3
CT 1006 BG 1	Brooklyn	3
CT 1006 BG 2	Brooklyn	3
CT 1008 BG 1	Brooklyn	3
CT 1008 BG 2	Brooklyn	3
CT 101 BG 1	Brooklyn	3
CT 101 BG 2	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 101 BG 3	Brooklyn	1
CT 1010 BG 1	Brooklyn	3
CT 1010 BG 2	Brooklyn	3
CT 1012 BG 1	Brooklyn	3
CT 1012 BG 2	Brooklyn	1
CT 1014 BG 1	Brooklyn	3
CT 1014 BG 2	Brooklyn	3
CT 1016 BG 1	Brooklyn	3
CT 1018 BG 1	Brooklyn	3
CT 102 BG 1	Brooklyn	1
CT 102 BG 2	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 102 BG 3	Brooklyn	1
CT 1020 BG 1	Brooklyn	3
CT 1022 BG 1	Brooklyn	3
CT 1024 BG 1	Brooklyn	3
CT 1026 BG 1	Brooklyn	3
CT 1028 BG 1	Brooklyn	3
CT 1028 BG 2	Brooklyn	3
CT 1034 BG 1	Brooklyn	1
CT 104 BG 1	Brooklyn	1
CT 104 BG 2	Brooklyn	1
CT 104 BG 3	Brooklyn	1
CT 1058.01 BG 1	Brooklyn	1
CT 1058.01 BG 2	Brooklyn	1
CT 1058.01 BG 3	Brooklyn	1
CT 1058.04 BG 1	Brooklyn	3
CT 1058.04 BG 2	Brooklyn	2
CT 1058.04 BG 3	Brooklyn	3
CT 1058.04 BG 4	Brooklyn	1
CT 106 BG 1	Brooklyn	1
CT 106 BG 2	Brooklyn	1
CT 106 BG 3	Brooklyn	1
CT 1070 BG 1	Brooklyn	3
CT 1078 BG 1	Brooklyn	1
CT 1078 BG 2	Brooklyn	3
CT 1078 BG 3	Brooklyn	3
CT 1078 BG 4	Brooklyn	3
CT 108 BG 1	Brooklyn	1
CT 108 BG 2	Brooklyn	1
CT 108 BG 3	Brooklyn	1
CT 1098 BG 1	Brooklyn	3
CT 1098 BG 2	Brooklyn	1
CT 110 BG 1	Brooklyn	1
CT 110 BG 2	Brooklyn	1
CT 1104 BG 1	Brooklyn	3
CT 1104 BG 2	Brooklyn	1
CT 1104 BG 3	Brooklyn	1
CT 1104 BG 4	Brooklyn	3
CT 1106 BG 1	Brooklyn	1
CT 1106 BG 2	Brooklyn	1
CT 1110 BG 1	Brooklyn	1
CT 1110 BG 2	Brooklyn	1
CT 1116 BG 1	Brooklyn	1
CT 1116 BG 2	Brooklyn	3
CT 1118 BG 1	Brooklyn	1
CT 1118 BG 2	Brooklyn	1
CT 112 BG 1	Brooklyn	1
CT 112 BG 2	Brooklyn	2
CT 112 BG 3	Brooklyn	1
CT 112 BG 4	Brooklyn	1
CT 1120 BG 1	Brooklyn	1
CT 1120 BG 2	Brooklyn	1
CT 1122 BG 1	Brooklyn	1
CT 1122 BG 2	Brooklyn	1
CT 1124 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 1124 BG 2	Brooklyn	3
CT 1124 BG 3	Brooklyn	3
CT 1126 BG 1	Brooklyn	1
CT 1126 BG 2	Brooklyn	1
CT 1126 BG 3	Brooklyn	3
CT 1128 BG 1	Brooklyn	1
CT 1128 BG 2	Brooklyn	3
CT 1128 BG 3	Brooklyn	1
CT 1130 BG 1	Brooklyn	1
CT 1130 BG 2	Brooklyn	1
CT 1130 BG 3	Brooklyn	1
CT 1130 BG 4	Brooklyn	3
CT 1132 BG 1	Brooklyn	3
CT 1132 BG 2	Brooklyn	3
CT 1134 BG 1	Brooklyn	1
CT 1134 BG 2	Brooklyn	1
CT 1134 BG 3	Brooklyn	1
CT 114 BG 1	Brooklyn	1
CT 114 BG 2	Brooklyn	2
CT 114 BG 3	Brooklyn	1
CT 1142.01 BG 1	Brooklyn	1
CT 1142.01 BG 2	Brooklyn	1
CT 1142.02 BG 1	Brooklyn	1
CT 1142.02 BG 2	Brooklyn	3
CT 1144 BG 1	Brooklyn	1
CT 1144 BG 2	Brooklyn	1
CT 1144 BG 3	Brooklyn	3
CT 1144 BG 4	Brooklyn	1
CT 1146 BG 1	Brooklyn	1
CT 1146 BG 2	Brooklyn	1
CT 1150 BG 1	Brooklyn	1
CT 1150 BG 2	Brooklyn	1
CT 1150 BG 3	Brooklyn	1
CT 1152 BG 1	Brooklyn	3
CT 1152 BG 2	Brooklyn	1
CT 1152 BG 3	Brooklyn	1
CT 1156 BG 1	Brooklyn	3
CT 1156 BG 2	Brooklyn	1
CT 1156 BG 3	Brooklyn	1
CT 1156 BG 4	Brooklyn	3
CT 1158 BG 1	Brooklyn	1
CT 1158 BG 2	Brooklyn	3
CT 1158 BG 3	Brooklyn	3
CT 116 BG 1	Brooklyn	1
CT 116 BG 2	Brooklyn	1
CT 116 BG 3	Brooklyn	1
CT 1160 BG 1	Brooklyn	1
CT 1160 BG 2	Brooklyn	1
CT 1160 BG 3	Brooklyn	1
CT 1162 BG 1	Brooklyn	3
CT 1162 BG 2	Brooklyn	1
CT 1162 BG 3	Brooklyn	1
CT 1164 BG 1	Brooklyn	1
CT 1164 BG 2	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 1164 BG 3	Brooklyn	1
CT 1166 BG 1	Brooklyn	3
CT 1166 BG 2	Brooklyn	1
CT 1166 BG 3	Brooklyn	1
CT 1168 BG 1	Brooklyn	3
CT 1168 BG 2	Brooklyn	3
CT 1170 BG 1	Brooklyn	1
CT 1170 BG 2	Brooklyn	1
CT 1172.01 BG 1	Brooklyn	3
CT 1172.01 BG 2	Brooklyn	1
CT 1172.02 BG 1	Brooklyn	3
CT 1172.02 BG 2	Brooklyn	3
CT 1174 BG 1	Brooklyn	1
CT 1174 BG 2	Brooklyn	1
CT 1176.01 BG 1	Brooklyn	3
CT 1176.01 BG 2	Brooklyn	1
CT 1176.02 BG 1	Brooklyn	1
CT 1176.02 BG 2	Brooklyn	1
CT 1178 BG 1	Brooklyn	1
CT 118 BG 1	Brooklyn	1
CT 118 BG 2	Brooklyn	1
CT 1182.01 BG 1	Brooklyn	3
CT 1182.01 BG 2	Brooklyn	3
CT 1182.02 BG 1	Brooklyn	1
CT 1182.02 BG 2	Brooklyn	1
CT 1184 BG 1	Brooklyn	1
CT 1184 BG 2	Brooklyn	3
CT 1184 BG 3	Brooklyn	1
CT 1186 BG 1	Brooklyn	3
CT 1186 BG 2	Brooklyn	3
CT 1188 BG 1	Brooklyn	3
CT 1188 BG 2	Brooklyn	1
CT 1188 BG 3	Brooklyn	1
CT 1190 BG 1	Brooklyn	1
CT 1190 BG 2	Brooklyn	1
CT 1192 BG 1	Brooklyn	1
CT 1192 BG 2	Brooklyn	3
CT 1192 BG 3	Brooklyn	1
CT 1194 BG 1	Brooklyn	3
CT 1194 BG 2	Brooklyn	1
CT 1194 BG 3	Brooklyn	1
CT 1196 BG 1	Brooklyn	1
CT 1196 BG 2	Brooklyn	1
CT 1196 BG 3	Brooklyn	1
CT 1196 BG 4	Brooklyn	1
CT 1198 BG 1	Brooklyn	1
CT 1198 BG 2	Brooklyn	1
CT 1198 BG 3	Brooklyn	1
CT 120 BG 1	Brooklyn	1
CT 1200 BG 1	Brooklyn	1
CT 1200 BG 2	Brooklyn	1
CT 1202 BG 1	Brooklyn	1
CT 1202 BG 2	Brooklyn	1
CT 1208 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 1208 BG 2	Brooklyn	1
CT 1208 BG 3	Brooklyn	1
CT 1208 BG 4	Brooklyn	3
CT 1208 BG 5	Brooklyn	1
CT 121 BG 2	Brooklyn	1
CT 1210 BG 1	Brooklyn	1
CT 1210 BG 2	Brooklyn	1
CT 1214 BG 1	Brooklyn	1
CT 1214 BG 2	Brooklyn	1
CT 122 BG 1	Brooklyn	1
CT 122 BG 2	Brooklyn	1
CT 122 BG 3	Brooklyn	1
CT 1220 BG 1	Brooklyn	1
CT 1220 BG 2	Brooklyn	1
CT 1237 BG 1	Brooklyn	2
CT 1237 BG 2	Brooklyn	2
CT 1237 BG 3	Brooklyn	2
CT 126 BG 1	Brooklyn	1
CT 126 BG 2	Brooklyn	1
CT 126 BG 3	Brooklyn	1
CT 127 BG 3	Brooklyn	1
CT 128.01 BG 1	Brooklyn	1
CT 129.01 BG 1	Brooklyn	3
CT 13 BG 2	Brooklyn	2
CT 130 BG 1	Brooklyn	1
CT 130 BG 2	Brooklyn	2
CT 130 BG 4	Brooklyn	1
CT 131 BG 4	Brooklyn	3
CT 132 BG 1	Brooklyn	1
CT 132 BG 2	Brooklyn	1
CT 136 BG 3	Brooklyn	2
CT 138 BG 2	Brooklyn	3
CT 141 BG 1	Brooklyn	3
CT 143 BG 1	Brooklyn	3
CT 143 BG 3	Brooklyn	3
CT 145 BG 1	Brooklyn	3
CT 15 BG 1	Brooklyn	3
CT 15 BG 2	Brooklyn	1
CT 15 BG 3	Brooklyn	3
CT 152 BG 3	Brooklyn	3
CT 1522 BG 1	Brooklyn	3
CT 1522 BG 2	Brooklyn	3
CT 153 BG 1	Brooklyn	3
CT 160 BG 1	Brooklyn	3
CT 160 BG 2	Brooklyn	3
CT 160 BG 3	Brooklyn	3
CT 161 BG 1	Brooklyn	3
CT 163 BG 1	Brooklyn	3
CT 164 BG 1	Brooklyn	3
CT 170 BG 1	Brooklyn	3
CT 170 BG 3	Brooklyn	3
CT 172 BG 1	Brooklyn	3
CT 172 BG 2	Brooklyn	3
CT 176 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 176 BG 2	Brooklyn	2
CT 178 BG 1	Brooklyn	1
CT 178 BG 2	Brooklyn	3
CT 179 BG 1	Brooklyn	1
CT 179 BG 2	Brooklyn	3
CT 179 BG 3	Brooklyn	3
CT 18 BG 1	Brooklyn	3
CT 180 BG 1	Brooklyn	3
CT 180 BG 2	Brooklyn	3
CT 181 BG 1	Brooklyn	3
CT 181 BG 2	Brooklyn	3
CT 182 BG 1	Brooklyn	1
CT 182 BG 2	Brooklyn	3
CT 184 BG 1	Brooklyn	3
CT 184 BG 2	Brooklyn	3
CT 185.01 BG 1	Brooklyn	3
CT 185.01 BG 2	Brooklyn	1
CT 185.01 BG 3	Brooklyn	1
CT 185.01 BG 4	Brooklyn	1
CT 186 BG 1	Brooklyn	1
CT 187 BG 1	Brooklyn	1
CT 188 BG 2	Brooklyn	3
CT 190 BG 1	Brooklyn	1
CT 190 BG 2	Brooklyn	1
CT 190 BG 3	Brooklyn	1
CT 191 BG 1	Brooklyn	2
CT 191 BG 3	Brooklyn	3
CT 192 BG 1	Brooklyn	2
CT 192 BG 2	Brooklyn	1
CT 193 BG 1	Brooklyn	2
CT 193 BG 2	Brooklyn	3
CT 193 BG 3	Brooklyn	3
CT 193 BG 4	Brooklyn	3
CT 194 BG 1	Brooklyn	1
CT 194 BG 2	Brooklyn	1
CT 195 BG 2	Brooklyn	3
CT 195 BG 3	Brooklyn	3
CT 196 BG 1	Brooklyn	1
CT 196 BG 2	Brooklyn	2
CT 196 BG 3	Brooklyn	1
CT 197 BG 1	Brooklyn	3
CT 197 BG 4	Brooklyn	3
CT 198 BG 1	Brooklyn	3
CT 198 BG 2	Brooklyn	2
CT 199 BG 3	Brooklyn	3
CT 2 BG 1	Brooklyn	1
CT 20 BG 1	Brooklyn	1
CT 20 BG 2	Brooklyn	1
CT 200 BG 1	Brooklyn	1
CT 200 BG 2	Brooklyn	3
CT 201 BG 1	Brooklyn	3
CT 201 BG 4	Brooklyn	3
CT 202 BG 1	Brooklyn	3
CT 203 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 203 BG 2	Brooklyn	3
CT 205 BG 2	Brooklyn	3
CT 205 BG 3	Brooklyn	3
CT 206 BG 1	Brooklyn	3
CT 208 BG 1	Brooklyn	1
CT 208 BG 2	Brooklyn	3
CT 208 BG 3	Brooklyn	1
CT 210 BG 1	Brooklyn	1
CT 210 BG 2	Brooklyn	1
CT 210 BG 3	Brooklyn	1
CT 211 BG 1	Brooklyn	3
CT 211 BG 2	Brooklyn	3
CT 212 BG 1	Brooklyn	1
CT 212 BG 2	Brooklyn	1
CT 212 BG 3	Brooklyn	1
CT 213 BG 1	Brooklyn	3
CT 213 BG 2	Brooklyn	3
CT 213 BG 3	Brooklyn	3
CT 214 BG 1	Brooklyn	2
CT 214 BG 2	Brooklyn	1
CT 215 BG 2	Brooklyn	1
CT 215 BG 3	Brooklyn	3
CT 215 BG 4	Brooklyn	3
CT 216 BG 1	Brooklyn	2
CT 216 BG 2	Brooklyn	2
CT 216 BG 3	Brooklyn	2
CT 217 BG 1	Brooklyn	3
CT 217 BG 2	Brooklyn	3
CT 218 BG 1	Brooklyn	2
CT 218 BG 2	Brooklyn	2
CT 218 BG 3	Brooklyn	2
CT 219 BG 1	Brooklyn	3
CT 219 BG 2	Brooklyn	3
CT 219 BG 3	Brooklyn	3
CT 22 BG 1	Brooklyn	1
CT 22 BG 2	Brooklyn	3
CT 22 BG 3	Brooklyn	3
CT 220 BG 1	Brooklyn	2
CT 220 BG 2	Brooklyn	2
CT 220 BG 3	Brooklyn	2
CT 220 BG 4	Brooklyn	2
CT 221 BG 1	Brooklyn	1
CT 221 BG 2	Brooklyn	3
CT 221 BG 3	Brooklyn	3
CT 222 BG 1	Brooklyn	2
CT 222 BG 2	Brooklyn	2
CT 222 BG 3	Brooklyn	2
CT 224 BG 1	Brooklyn	2
CT 224 BG 2	Brooklyn	2
CT 224 BG 3	Brooklyn	2
CT 224 BG 4	Brooklyn	2
CT 226 BG 1	Brooklyn	1
CT 226 BG 2	Brooklyn	1
CT 227 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 227 BG 2	Brooklyn	3
CT 227 BG 3	Brooklyn	3
CT 227 BG 4	Brooklyn	3
CT 228 BG 1	Brooklyn	1
CT 228 BG 2	Brooklyn	2
CT 228 BG 3	Brooklyn	2
CT 229 BG 1	Brooklyn	3
CT 229 BG 2	Brooklyn	3
CT 229 BG 3	Brooklyn	1
CT 229 BG 4	Brooklyn	3
CT 23 BG 1	Brooklyn	1
CT 23 BG 2	Brooklyn	1
CT 23 BG 3	Brooklyn	1
CT 230 BG 1	Brooklyn	2
CT 230 BG 2	Brooklyn	2
CT 230 BG 3	Brooklyn	2
CT 231 BG 1	Brooklyn	3
CT 231 BG 2	Brooklyn	3
CT 231 BG 3	Brooklyn	3
CT 232 BG 1	Brooklyn	2
CT 232 BG 2	Brooklyn	2
CT 232 BG 3	Brooklyn	2
CT 232 BG 4	Brooklyn	2
CT 232 BG 5	Brooklyn	2
CT 233 BG 2	Brooklyn	1
CT 234 BG 1	Brooklyn	2
CT 234 BG 2	Brooklyn	2
CT 234 BG 3	Brooklyn	2
CT 235 BG 1	Brooklyn	2
CT 235 BG 2	Brooklyn	2
CT 236 BG 1	Brooklyn	2
CT 236 BG 2	Brooklyn	2
CT 236 BG 3	Brooklyn	2
CT 236 BG 4	Brooklyn	2
CT 238 BG 1	Brooklyn	2
CT 238 BG 2	Brooklyn	2
CT 238 BG 3	Brooklyn	2
CT 240 BG 1	Brooklyn	2
CT 240 BG 2	Brooklyn	2
CT 240 BG 3	Brooklyn	2
CT 241 BG 2	Brooklyn	1
CT 242 BG 1	Brooklyn	2
CT 242 BG 2	Brooklyn	2
CT 243 BG 1	Brooklyn	3
CT 243 BG 2	Brooklyn	3
CT 243 BG 3	Brooklyn	3
CT 244 BG 1	Brooklyn	2
CT 244 BG 2	Brooklyn	2
CT 244 BG 3	Brooklyn	2
CT 245 BG 1	Brooklyn	3
CT 245 BG 2	Brooklyn	1
CT 245 BG 3	Brooklyn	3
CT 245 BG 4	Brooklyn	3
CT 246 BG 2	Brooklyn	1
CT 246 BG 3	Brooklyn	2
CT 247 BG 1	Brooklyn	1
CT 247 BG 2	Brooklyn	1
CT 248 BG 1	Brooklyn	3
CT 248 BG 2	Brooklyn	3
CT 249 BG 1	Brooklyn	3
CT 249 BG 2	Brooklyn	3
CT 249 BG 3	Brooklyn	3
CT 250 BG 1	Brooklyn	1
CT 250 BG 2	Brooklyn	1
CT 251 BG 1	Brooklyn	1
CT 251 BG 2	Brooklyn	1
CT 251 BG 3	Brooklyn	3
CT 252 BG 1	Brooklyn	3
CT 252 BG 2	Brooklyn	2
CT 252 BG 3	Brooklyn	3
CT 252 BG 4	Brooklyn	3
CT 253 BG 1	Brooklyn	1
CT 253 BG 2	Brooklyn	1
CT 253 BG 3	Brooklyn	1
CT 254 BG 1	Brooklyn	3
CT 254 BG 3	Brooklyn	1
CT 255 BG 1	Brooklyn	1
CT 255 BG 2	Brooklyn	1
CT 256 BG 1	Brooklyn	1
CT 256 BG 2	Brooklyn	1
CT 257 BG 1	Brooklyn	1
CT 257 BG 2	Brooklyn	1
CT 257 BG 3	Brooklyn	3
CT 258 BG 1	Brooklyn	1
CT 258 BG 2	Brooklyn	1
CT 259.01 BG 1	Brooklyn	1
CT 259.02 BG 1	Brooklyn	1
CT 260 BG 1	Brooklyn	1
CT 260 BG 2	Brooklyn	1
CT 260 BG 3	Brooklyn	3
CT 261 BG 1	Brooklyn	1
CT 261 BG 2	Brooklyn	3
CT 261 BG 3	Brooklyn	1
CT 261 BG 4	Brooklyn	1
CT 261 BG 5	Brooklyn	3
CT 262 BG 1	Brooklyn	1
CT 262 BG 2	Brooklyn	1
CT 263 BG 1	Brooklyn	1
CT 264 BG 1	Brooklyn	1
CT 264 BG 2	Brooklyn	3
CT 264 BG 3	Brooklyn	1
CT 264 BG 4	Brooklyn	3
CT 265 BG 1	Brooklyn	3
CT 265 BG 2	Brooklyn	3
CT 265 BG 3	Brooklyn	3
CT 265 BG 4	Brooklyn	3
CT 266 BG 1	Brooklyn	1
CT 266 BG 2	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 266 BG 3	Brooklyn	1
CT 267 BG 1	Brooklyn	1
CT 267 BG 2	Brooklyn	3
CT 267 BG 3	Brooklyn	3
CT 267 BG 4	Brooklyn	3
CT 268 BG 1	Brooklyn	1
CT 268 BG 2	Brooklyn	3
CT 268 BG 3	Brooklyn	3
CT 268 BG 4	Brooklyn	2
CT 269 BG 1	Brooklyn	3
CT 269 BG 2	Brooklyn	3
CT 269 BG 3	Brooklyn	3
CT 270 BG 2	Brooklyn	2
CT 271 BG 1	Brooklyn	3
CT 271 BG 2	Brooklyn	3
CT 272 BG 1	Brooklyn	3
CT 272 BG 2	Brooklyn	1
CT 273 BG 1	Brooklyn	3
CT 273 BG 2	Brooklyn	3
CT 273 BG 3	Brooklyn	1
CT 274 BG 1	Brooklyn	3
CT 274 BG 2	Brooklyn	2
CT 275 BG 1	Brooklyn	1
CT 275 BG 2	Brooklyn	3
CT 275 BG 3	Brooklyn	3
CT 275 BG 4	Brooklyn	3
CT 276 BG 1	Brooklyn	1
CT 276 BG 2	Brooklyn	1
CT 276 BG 3	Brooklyn	1
CT 277 BG 1	Brooklyn	1
CT 277 BG 2	Brooklyn	3
CT 277 BG 3	Brooklyn	1
CT 277 BG 4	Brooklyn	1
CT 278 BG 2	Brooklyn	3
CT 279 BG 1	Brooklyn	1
CT 279 BG 2	Brooklyn	3
CT 279 BG 3	Brooklyn	3
CT 279 BG 4	Brooklyn	3
CT 280 BG 1	Brooklyn	3
CT 280 BG 2	Brooklyn	3
CT 281 BG 1	Brooklyn	1
CT 281 BG 2	Brooklyn	1
CT 281 BG 3	Brooklyn	1
CT 282 BG 1	Brooklyn	3
CT 282 BG 2	Brooklyn	1
CT 282 BG 3	Brooklyn	2
CT 283 BG 1	Brooklyn	1
CT 283 BG 2	Brooklyn	1
CT 283 BG 3	Brooklyn	1
CT 284 BG 1	Brooklyn	3
CT 284 BG 2	Brooklyn	2
CT 284 BG 3	Brooklyn	1
CT 285.01 BG 1	Brooklyn	1
CT 285.02 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 286 BG 2	Brooklyn	2
CT 286 BG 3	Brooklyn	1
CT 286 BG 4	Brooklyn	1
CT 286 BG 5	Brooklyn	1
CT 287 BG 1	Brooklyn	3
CT 287 BG 2	Brooklyn	1
CT 287 BG 3	Brooklyn	1
CT 288 BG 1	Brooklyn	1
CT 288 BG 2	Brooklyn	1
CT 288 BG 3	Brooklyn	1
CT 289 BG 1	Brooklyn	3
CT 289 BG 2	Brooklyn	3
CT 289 BG 3	Brooklyn	3
CT 289 BG 4	Brooklyn	1
CT 29.01 BG 1	Brooklyn	1
CT 29.01 BG 2	Brooklyn	1
CT 290 BG 1	Brooklyn	2
CT 290 BG 3	Brooklyn	3
CT 291 BG 1	Brooklyn	3
CT 291 BG 2	Brooklyn	1
CT 291 BG 3	Brooklyn	3
CT 292 BG 1	Brooklyn	1
CT 292 BG 2	Brooklyn	3
CT 293 BG 1	Brooklyn	1
CT 293 BG 2	Brooklyn	1
CT 293 BG 3	Brooklyn	3
CT 293 BG 4	Brooklyn	3
CT 294 BG 1	Brooklyn	1
CT 295 BG 1	Brooklyn	3
CT 295 BG 2	Brooklyn	3
CT 295 BG 3	Brooklyn	3
CT 295 BG 4	Brooklyn	3
CT 296 BG 1	Brooklyn	2
CT 296 BG 2	Brooklyn	3
CT 296 BG 3	Brooklyn	3
CT 296 BG 4	Brooklyn	1
CT 297 BG 1	Brooklyn	3
CT 297 BG 2	Brooklyn	1
CT 297 BG 3	Brooklyn	3
CT 298 BG 1	Brooklyn	3
CT 298 BG 2	Brooklyn	3
CT 298 BG 3	Brooklyn	2
CT 299 BG 1	Brooklyn	1
CT 299 BG 2	Brooklyn	1
CT 300 BG 1	Brooklyn	1
CT 300 BG 2	Brooklyn	1
CT 301 BG 1	Brooklyn	1
CT 301 BG 2	Brooklyn	1
CT 301 BG 3	Brooklyn	3
CT 302 BG 1	Brooklyn	3
CT 302 BG 2	Brooklyn	3
CT 302 BG 3	Brooklyn	1
CT 303 BG 1	Brooklyn	3
CT 303 BG 2	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 303 BG 3	Brooklyn	1
CT 304 BG 1	Brooklyn	3
CT 304 BG 2	Brooklyn	2
CT 304 BG 3	Brooklyn	1
CT 305 BG 1	Brooklyn	3
CT 305 BG 2	Brooklyn	3
CT 305 BG 3	Brooklyn	3
CT 305 BG 4	Brooklyn	3
CT 306 BG 1	Brooklyn	1
CT 307 BG 1	Brooklyn	1
CT 307 BG 2	Brooklyn	1
CT 307 BG 3	Brooklyn	1
CT 309 BG 1	Brooklyn	1
CT 309 BG 2	Brooklyn	3
CT 31 BG 1	Brooklyn	3
CT 31 BG 2	Brooklyn	3
CT 31 BG 3	Brooklyn	3
CT 311 BG 1	Brooklyn	1
CT 311 BG 2	Brooklyn	1
CT 311 BG 3	Brooklyn	3
CT 313 BG 1	Brooklyn	1
CT 313 BG 2	Brooklyn	3
CT 313 BG 3	Brooklyn	1
CT 313 BG 4	Brooklyn	3
CT 314 BG 4	Brooklyn	3
CT 315 BG 1	Brooklyn	3
CT 315 BG 2	Brooklyn	3
CT 315 BG 3	Brooklyn	3
CT 315 BG 4	Brooklyn	3
CT 317.01 BG 1	Brooklyn	3
CT 317.01 BG 2	Brooklyn	1
CT 317.01 BG 3	Brooklyn	3
CT 317.02 BG 1	Brooklyn	1
CT 317.02 BG 2	Brooklyn	3
CT 317.02 BG 3	Brooklyn	3
CT 319 BG 1	Brooklyn	1
CT 319 BG 2	Brooklyn	2
CT 319 BG 3	Brooklyn	1
CT 321 BG 1	Brooklyn	1
CT 321 BG 2	Brooklyn	3
CT 321 BG 3	Brooklyn	3
CT 321 BG 4	Brooklyn	3
CT 323 BG 1	Brooklyn	3
CT 323 BG 2	Brooklyn	3
CT 323 BG 3	Brooklyn	3
CT 325 BG 1	Brooklyn	3
CT 325 BG 2	Brooklyn	1
CT 325 BG 3	Brooklyn	1
CT 326 BG 1	Brooklyn	1
CT 326 BG 2	Brooklyn	1
CT 326 BG 3	Brooklyn	1
CT 326 BG 4	Brooklyn	1
CT 326 BG 5	Brooklyn	1
CT 327 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 327 BG 2	Brooklyn	3
CT 327 BG 3	Brooklyn	1
CT 328 BG 1	Brooklyn	3
CT 328 BG 2	Brooklyn	1
CT 328 BG 3	Brooklyn	1
CT 328 BG 4	Brooklyn	3
CT 329 BG 1	Brooklyn	2
CT 329 BG 2	Brooklyn	1
CT 329 BG 3	Brooklyn	1
CT 329 BG 4	Brooklyn	3
CT 33 BG 2	Brooklyn	3
CT 330 BG 1	Brooklyn	1
CT 330 BG 2	Brooklyn	3
CT 330 BG 3	Brooklyn	1
CT 331 BG 1	Brooklyn	2
CT 331 BG 2	Brooklyn	2
CT 333 BG 2	Brooklyn	2
CT 333 BG 3	Brooklyn	2
CT 335 BG 1	Brooklyn	2
CT 335 BG 2	Brooklyn	2
CT 335 BG 3	Brooklyn	2
CT 337 BG 1	Brooklyn	1
CT 337 BG 2	Brooklyn	2
CT 339 BG 1	Brooklyn	1
CT 339 BG 2	Brooklyn	1
CT 339 BG 3	Brooklyn	1
CT 339 BG 4	Brooklyn	3
CT 34 BG 2	Brooklyn	3
CT 340 BG 1	Brooklyn	1
CT 340 BG 2	Brooklyn	2
CT 341 BG 1	Brooklyn	3
CT 341 BG 2	Brooklyn	3
CT 341 BG 3	Brooklyn	1
CT 342 BG 1	Brooklyn	1
CT 342 BG 2	Brooklyn	1
CT 342 BG 3	Brooklyn	1
CT 342 BG 4	Brooklyn	2
CT 343 BG 1	Brooklyn	1
CT 343 BG 2	Brooklyn	3
CT 343 BG 3	Brooklyn	3
CT 345 BG 1	Brooklyn	1
CT 345 BG 2	Brooklyn	1
CT 347 BG 1	Brooklyn	1
CT 347 BG 2	Brooklyn	3
CT 347 BG 3	Brooklyn	1
CT 348 BG 1	Brooklyn	1
CT 348 BG 2	Brooklyn	1
CT 349 BG 1	Brooklyn	1
CT 349 BG 2	Brooklyn	1
CT 349 BG 3	Brooklyn	3
CT 349 BG 4	Brooklyn	1
CT 35 BG 2	Brooklyn	3
CT 350 BG 1	Brooklyn	2
CT 351 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 351 BG 2	Brooklyn	1
CT 351 BG 3	Brooklyn	1
CT 352 BG 1	Brooklyn	2
CT 353 BG 1	Brooklyn	1
CT 353 BG 2	Brooklyn	1
CT 353 BG 3	Brooklyn	3
CT 355 BG 1	Brooklyn	1
CT 355 BG 2	Brooklyn	1
CT 355 BG 3	Brooklyn	1
CT 356.02 BG 1	Brooklyn	2
CT 357 BG 1	Brooklyn	1
CT 359 BG 1	Brooklyn	1
CT 359 BG 2	Brooklyn	1
CT 359 BG 3	Brooklyn	1
CT 359 BG 4	Brooklyn	1
CT 360.01 BG 1	Brooklyn	2
CT 360.01 BG 2	Brooklyn	2
CT 360.01 BG 3	Brooklyn	2
CT 360.02 BG 1	Brooklyn	2
CT 360.02 BG 2	Brooklyn	2
CT 361 BG 1	Brooklyn	1
CT 361 BG 2	Brooklyn	1
CT 361 BG 3	Brooklyn	1
CT 362 BG 1	Brooklyn	2
CT 362 BG 2	Brooklyn	1
CT 363 BG 1	Brooklyn	1
CT 363 BG 2	Brooklyn	1
CT 363 BG 3	Brooklyn	1
CT 363 BG 4	Brooklyn	1
CT 364 BG 1	Brooklyn	2
CT 365.01 BG 1	Brooklyn	1
CT 365.01 BG 2	Brooklyn	3
CT 365.02 BG 1	Brooklyn	1
CT 366 BG 1	Brooklyn	1
CT 366 BG 2	Brooklyn	2
CT 366 BG 3	Brooklyn	1
CT 367 BG 1	Brooklyn	3
CT 367 BG 2	Brooklyn	3
CT 369 BG 1	Brooklyn	1
CT 369 BG 2	Brooklyn	1
CT 369 BG 3	Brooklyn	1
CT 369 BG 4	Brooklyn	1
CT 370 BG 1	Brooklyn	2
CT 370 BG 3	Brooklyn	3
CT 371 BG 1	Brooklyn	3
CT 371 BG 2	Brooklyn	3
CT 371 BG 3	Brooklyn	3
CT 371 BG 4	Brooklyn	1
CT 371 BG 5	Brooklyn	1
CT 373 BG 1	Brooklyn	1
CT 373 BG 2	Brooklyn	1
CT 373 BG 3	Brooklyn	1
CT 373 BG 4	Brooklyn	1
CT 374.01 BG 2	Brooklyn	2
CT 374.02 BG 1	Brooklyn	1
CT 374.02 BG 2	Brooklyn	2
CT 374.02 BG 3	Brooklyn	2
CT 374.02 BG 4	Brooklyn	2
CT 375 BG 1	Brooklyn	3
CT 375 BG 2	Brooklyn	1
CT 375 BG 3	Brooklyn	3
CT 377 BG 1	Brooklyn	1
CT 377 BG 2	Brooklyn	1
CT 377 BG 3	Brooklyn	3
CT 377 BG 4	Brooklyn	3
CT 379 BG 1	Brooklyn	3
CT 379 BG 2	Brooklyn	1
CT 379 BG 3	Brooklyn	3
CT 381 BG 1	Brooklyn	3
CT 381 BG 2	Brooklyn	1
CT 381 BG 3	Brooklyn	3
CT 381 BG 4	Brooklyn	1
CT 382 BG 1	Brooklyn	1
CT 382 BG 2	Brooklyn	1
CT 382 BG 3	Brooklyn	1
CT 383 BG 1	Brooklyn	3
CT 383 BG 2	Brooklyn	1
CT 383 BG 3	Brooklyn	3
CT 383 BG 4	Brooklyn	3
CT 385 BG 1	Brooklyn	3
CT 385 BG 2	Brooklyn	3
CT 385 BG 3	Brooklyn	1
CT 385 BG 4	Brooklyn	3
CT 386 BG 1	Brooklyn	3
CT 386 BG 2	Brooklyn	3
CT 387 BG 1	Brooklyn	3
CT 387 BG 2	Brooklyn	1
CT 387 BG 3	Brooklyn	1
CT 387 BG 4	Brooklyn	3
CT 388 BG 3	Brooklyn	2
CT 389 BG 1	Brooklyn	3
CT 389 BG 2	Brooklyn	3
CT 389 BG 3	Brooklyn	1
CT 39 BG 1	Brooklyn	3
CT 390 BG 1	Brooklyn	2
CT 391 BG 1	Brooklyn	1
CT 391 BG 2	Brooklyn	1
CT 393 BG 1	Brooklyn	3
CT 393 BG 2	Brooklyn	3
CT 393 BG 3	Brooklyn	1
CT 394 BG 1	Brooklyn	2
CT 394 BG 2	Brooklyn	2
CT 395 BG 1	Brooklyn	3
CT 395 BG 2	Brooklyn	1
CT 395 BG 3	Brooklyn	1
CT 396 BG 2	Brooklyn	2
CT 397 BG 1	Brooklyn	1
CT 397 BG 2	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 397 BG 3	Brooklyn	1
CT 398 BG 1	Brooklyn	3
CT 398 BG 2	Brooklyn	1
CT 399 BG 1	Brooklyn	1
CT 399 BG 2	Brooklyn	3
CT 399 BG 3	Brooklyn	1
CT 400 BG 2	Brooklyn	3
CT 400 BG 3	Brooklyn	1
CT 401 BG 1	Brooklyn	1
CT 401 BG 2	Brooklyn	1
CT 401 BG 3	Brooklyn	1
CT 402 BG 1	Brooklyn	3
CT 402 BG 2	Brooklyn	1
CT 403 BG 1	Brooklyn	1
CT 403 BG 2	Brooklyn	3
CT 403 BG 3	Brooklyn	1
CT 404 BG 1	Brooklyn	3
CT 404 BG 2	Brooklyn	1
CT 405 BG 1	Brooklyn	1
CT 405 BG 2	Brooklyn	1
CT 406 BG 1	Brooklyn	1
CT 406 BG 2	Brooklyn	1
CT 406 BG 3	Brooklyn	3
CT 408 BG 1	Brooklyn	3
CT 408 BG 2	Brooklyn	3
CT 408 BG 3	Brooklyn	3
CT 409 BG 1	Brooklyn	1
CT 409 BG 2	Brooklyn	3
CT 409 BG 3	Brooklyn	1
CT 410 BG 1	Brooklyn	2
CT 410 BG 2	Brooklyn	2
CT 411 BG 1	Brooklyn	1
CT 411 BG 2	Brooklyn	1
CT 411 BG 3	Brooklyn	3
CT 412 BG 1	Brooklyn	2
CT 413 BG 1	Brooklyn	1
CT 413 BG 2	Brooklyn	3
CT 413 BG 3	Brooklyn	1
CT 414.01 BG 1	Brooklyn	2
CT 414.02 BG 2	Brooklyn	2
CT 415 BG 1	Brooklyn	3
CT 415 BG 2	Brooklyn	3
CT 415 BG 3	Brooklyn	1
CT 416 BG 1	Brooklyn	2
CT 416 BG 2	Brooklyn	2
CT 417 BG 1	Brooklyn	1
CT 417 BG 2	Brooklyn	1
CT 417 BG 3	Brooklyn	1
CT 417 BG 4	Brooklyn	1
CT 418 BG 1	Brooklyn	2
CT 418 BG 2	Brooklyn	2
CT 419 BG 1	Brooklyn	1
CT 419 BG 2	Brooklyn	1
CT 419 BG 3	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 420 BG 1	Brooklyn	2
CT 421 BG 1	Brooklyn	1
CT 421 BG 2	Brooklyn	1
CT 421 BG 3	Brooklyn	1
CT 421 BG 4	Brooklyn	3
CT 422 BG 1	Brooklyn	2
CT 423 BG 1	Brooklyn	1
CT 423 BG 3	Brooklyn	3
CT 424 BG 1	Brooklyn	3
CT 424 BG 3	Brooklyn	1
CT 425 BG 1	Brooklyn	3
CT 425 BG 2	Brooklyn	3
CT 425 BG 3	Brooklyn	3
CT 426 BG 1	Brooklyn	1
CT 426 BG 2	Brooklyn	1
CT 426 BG 3	Brooklyn	3
CT 427 BG 1	Brooklyn	1
CT 427 BG 2	Brooklyn	1
CT 427 BG 3	Brooklyn	1
CT 427 BG 4	Brooklyn	1
CT 428 BG 1	Brooklyn	1
CT 429 BG 1	Brooklyn	1
CT 429 BG 2	Brooklyn	1
CT 429 BG 3	Brooklyn	3
CT 429 BG 4	Brooklyn	1
CT 43 BG 1	Brooklyn	3
CT 430 BG 2	Brooklyn	1
CT 430 BG 3	Brooklyn	1
CT 431 BG 1	Brooklyn	1
CT 431 BG 2	Brooklyn	3
CT 431 BG 3	Brooklyn	1
CT 431 BG 4	Brooklyn	1
CT 432 BG 1	Brooklyn	3
CT 432 BG 2	Brooklyn	1
CT 432 BG 3	Brooklyn	3
CT 433 BG 1	Brooklyn	1
CT 433 BG 2	Brooklyn	3
CT 433 BG 3	Brooklyn	1
CT 434 BG 1	Brooklyn	2
CT 434 BG 3	Brooklyn	1
CT 435 BG 1	Brooklyn	1
CT 435 BG 2	Brooklyn	3
CT 435 BG 3	Brooklyn	1
CT 436 BG 2	Brooklyn	1
CT 437 BG 1	Brooklyn	1
CT 437 BG 2	Brooklyn	3
CT 437 BG 3	Brooklyn	1
CT 437 BG 4	Brooklyn	1
CT 438 BG 1	Brooklyn	2
CT 438 BG 2	Brooklyn	2
CT 439 BG 1	Brooklyn	1
CT 439 BG 2	Brooklyn	1
CT 439 BG 3	Brooklyn	1
CT 440 BG 3	Brooklyn	2

Census Tract & Block Group ID	Place Name	Category
CT 441 BG 1	Brooklyn	1
CT 441 BG 2	Brooklyn	1
CT 441 BG 3	Brooklyn	3
CT 442 BG 2	Brooklyn	2
CT 443 BG 1	Brooklyn	1
CT 443 BG 2	Brooklyn	3
CT 443 BG 3	Brooklyn	3
CT 443 BG 4	Brooklyn	1
CT 444 BG 3	Brooklyn	2
CT 445 BG 1	Brooklyn	3
CT 445 BG 2	Brooklyn	1
CT 445 BG 3	Brooklyn	1
CT 446 BG 1	Brooklyn	3
CT 446 BG 2	Brooklyn	3
CT 447 BG 1	Brooklyn	1
CT 447 BG 2	Brooklyn	1
CT 448 BG 2	Brooklyn	2
CT 449 BG 1	Brooklyn	1
CT 449 BG 2	Brooklyn	1
CT 449 BG 4	Brooklyn	2
CT 450 BG 1	Brooklyn	2
CT 453 BG 1	Brooklyn	1
CT 453 BG 2	Brooklyn	2
CT 454 BG 1	Brooklyn	2
CT 456 BG 1	Brooklyn	2
CT 460 BG 2	Brooklyn	1
CT 460 BG 3	Brooklyn	1
CT 462.01 BG 1	Brooklyn	2
CT 462.01 BG 2	Brooklyn	2
CT 462.02 BG 1	Brooklyn	2
CT 462.02 BG 2	Brooklyn	2
CT 464 BG 1	Brooklyn	2
CT 464 BG 2	Brooklyn	2
CT 468 BG 1	Brooklyn	2
CT 470 BG 1	Brooklyn	2
CT 470 BG 2	Brooklyn	2
CT 472 BG 1	Brooklyn	2
CT 472 BG 2	Brooklyn	2
CT 474 BG 1	Brooklyn	2
CT 476 BG 1	Brooklyn	2
CT 476 BG 2	Brooklyn	2
CT 476 BG 3	Brooklyn	2
CT 478 BG 1	Brooklyn	2
CT 478 BG 3	Brooklyn	2
CT 480 BG 1	Brooklyn	2
CT 480 BG 2	Brooklyn	2
CT 482 BG 1	Brooklyn	1
CT 482 BG 2	Brooklyn	1
CT 482 BG 3	Brooklyn	1
CT 482 BG 4	Brooklyn	2
CT 484 BG 1	Brooklyn	2
CT 484 BG 2	Brooklyn	2
CT 484 BG 3	Brooklyn	2
CT 485 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 486 BG 1	Brooklyn	1
CT 486 BG 2	Brooklyn	1
CT 486 BG 3	Brooklyn	1
CT 488 BG 2	Brooklyn	1
CT 489 BG 1	Brooklyn	1
CT 489 BG 2	Brooklyn	1
CT 489 BG 3	Brooklyn	1
CT 49 BG 1	Brooklyn	3
CT 490 BG 1	Brooklyn	3
CT 490 BG 3	Brooklyn	2
CT 491 BG 1	Brooklyn	3
CT 491 BG 2	Brooklyn	3
CT 491 BG 3	Brooklyn	1
CT 491 BG 4	Brooklyn	1
CT 492 BG 1	Brooklyn	1
CT 492 BG 2	Brooklyn	3
CT 492 BG 3	Brooklyn	2
CT 493 BG 1	Brooklyn	1
CT 493 BG 4	Brooklyn	1
CT 493 BG 5	Brooklyn	1
CT 494 BG 1	Brooklyn	3
CT 494 BG 2	Brooklyn	1
CT 494 BG 3	Brooklyn	2
CT 495 BG 3	Brooklyn	3
CT 496 BG 1	Brooklyn	1
CT 496 BG 2	Brooklyn	3
CT 496 BG 3	Brooklyn	3
CT 498 BG 1	Brooklyn	3
CT 498 BG 2	Brooklyn	3
CT 498 BG 3	Brooklyn	3
CT 500 BG 3	Brooklyn	3
CT 503 BG 2	Brooklyn	1
CT 504 BG 3	Brooklyn	1
CT 505 BG 1	Brooklyn	1
CT 505 BG 3	Brooklyn	1
CT 506 BG 1	Brooklyn	1
CT 506 BG 2	Brooklyn	3
CT 506 BG 3	Brooklyn	1
CT 506 BG 4	Brooklyn	3
CT 507 BG 1	Brooklyn	2
CT 508.01 BG 1	Brooklyn	3
CT 508.01 BG 2	Brooklyn	1
CT 508.03 BG 1	Brooklyn	1
CT 508.04 BG 1	Brooklyn	3
CT 508.04 BG 2	Brooklyn	3
CT 508.04 BG 3	Brooklyn	1
CT 509 BG 1	Brooklyn	2
CT 509 BG 2	Brooklyn	2
CT 510.01 BG 1	Brooklyn	1
CT 510.01 BG 2	Brooklyn	1
CT 510.02 BG 1	Brooklyn	3
CT 510.02 BG 2	Brooklyn	1
CT 510.02 BG 3	Brooklyn	1
CT 511 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 511 BG 3	Brooklyn	1
CT 512 BG 1	Brooklyn	3
CT 512 BG 2	Brooklyn	3
CT 512 BG 3	Brooklyn	1
CT 512 BG 4	Brooklyn	3
CT 513 BG 2	Brooklyn	1
CT 513 BG 3	Brooklyn	3
CT 513 BG 4	Brooklyn	1
CT 514 BG 1	Brooklyn	3
CT 514 BG 2	Brooklyn	1
CT 514 BG 3	Brooklyn	3
CT 514 BG 4	Brooklyn	1
CT 516.01 BG 1	Brooklyn	3
CT 516.01 BG 2	Brooklyn	3
CT 516.01 BG 3	Brooklyn	1
CT 516.02 BG 1	Brooklyn	3
CT 516.02 BG 2	Brooklyn	3
CT 518 BG 1	Brooklyn	3
CT 518 BG 2	Brooklyn	3
CT 518 BG 3	Brooklyn	1
CT 520 BG 1	Brooklyn	3
CT 520 BG 2	Brooklyn	1
CT 520 BG 3	Brooklyn	1
CT 523 BG 1	Brooklyn	1
CT 523 BG 2	Brooklyn	1
CT 523 BG 3	Brooklyn	2
CT 523 BG 4	Brooklyn	1
CT 523 BG 5	Brooklyn	1
CT 525 BG 1	Brooklyn	2
CT 525 BG 2	Brooklyn	2
CT 526 BG 1	Brooklyn	3
CT 526 BG 3	Brooklyn	1
CT 527 BG 1	Brooklyn	3
CT 527 BG 3	Brooklyn	1
CT 527 BG 4	Brooklyn	1
CT 527 BG 5	Brooklyn	3
CT 527 BG 6	Brooklyn	3
CT 527 BG 7	Brooklyn	1
CT 528 BG 2	Brooklyn	3
CT 529 BG 2	Brooklyn	2
CT 529 BG 3	Brooklyn	2
CT 53 BG 2	Brooklyn	3
CT 530 BG 1	Brooklyn	1
CT 530 BG 2	Brooklyn	2
CT 530 BG 3	Brooklyn	2
CT 531 BG 1	Brooklyn	2
CT 531 BG 2	Brooklyn	2
CT 531 BG 3	Brooklyn	2
CT 531 BG 4	Brooklyn	2
CT 532 BG 1	Brooklyn	3
CT 533 BG 1	Brooklyn	2
CT 533 BG 2	Brooklyn	2
CT 533 BG 3	Brooklyn	2
CT 533 BG 4	Brooklyn	2
CT 533 BG 5	Brooklyn	2
CT 534 BG 1	Brooklyn	2
CT 534 BG 2	Brooklyn	2
CT 534 BG 3	Brooklyn	2
CT 534 BG 4	Brooklyn	1
CT 535 BG 1	Brooklyn	2
CT 535 BG 2	Brooklyn	2
CT 535 BG 3	Brooklyn	2
CT 535 BG 4	Brooklyn	2
CT 537 BG 1	Brooklyn	2
CT 537 BG 2	Brooklyn	2
CT 538 BG 1	Brooklyn	2
CT 538 BG 3	Brooklyn	2
CT 539 BG 1	Brooklyn	2
CT 539 BG 2	Brooklyn	2
CT 542 BG 1	Brooklyn	2
CT 542 BG 2	Brooklyn	2
CT 542 BG 3	Brooklyn	2
CT 543 BG 2	Brooklyn	3
CT 544 BG 1	Brooklyn	2
CT 544 BG 2	Brooklyn	3
CT 544 BG 3	Brooklyn	2
CT 545 BG 1	Brooklyn	2
CT 545 BG 2	Brooklyn	2
CT 545 BG 3	Brooklyn	2
CT 545 BG 5	Brooklyn	1
CT 545 BG 6	Brooklyn	2
CT 546 BG 2	Brooklyn	2
CT 546 BG 3	Brooklyn	2
CT 547 BG 1	Brooklyn	2
CT 547 BG 2	Brooklyn	2
CT 547 BG 3	Brooklyn	2
CT 551 BG 1	Brooklyn	3
CT 551 BG 2	Brooklyn	1
CT 551 BG 4	Brooklyn	3
CT 552 BG 2	Brooklyn	2
CT 553 BG 2	Brooklyn	3
CT 554 BG 1	Brooklyn	2
CT 554 BG 2	Brooklyn	2
CT 554 BG 3	Brooklyn	1
CT 556 BG 1	Brooklyn	2
CT 556 BG 2	Brooklyn	2
CT 556 BG 3	Brooklyn	3
CT 560 BG 2	Brooklyn	2
CT 562 BG 2	Brooklyn	2
CT 563 BG 2	Brooklyn	2
CT 566 BG 1	Brooklyn	3
CT 566 BG 2	Brooklyn	3
CT 570 BG 4	Brooklyn	3
CT 572 BG 1	Brooklyn	1
CT 572 BG 2	Brooklyn	1
CT 574 BG 1	Brooklyn	3
CT 574 BG 2	Brooklyn	3
CT 576 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 576 BG 2	Brooklyn	3
CT 578 BG 1	Brooklyn	1
CT 578 BG 2	Brooklyn	3
CT 579 BG 1	Brooklyn	3
CT 579 BG 2	Brooklyn	1
CT 58 BG 3	Brooklyn	1
CT 580 BG 1	Brooklyn	1
CT 580 BG 2	Brooklyn	3
CT 582 BG 1	Brooklyn	3
CT 582 BG 2	Brooklyn	1
CT 582 BG 3	Brooklyn	2
CT 586 BG 1	Brooklyn	1
CT 586 BG 2	Brooklyn	3
CT 590 BG 1	Brooklyn	1
CT 592 BG 2	Brooklyn	3
CT 594.01 BG 1	Brooklyn	3
CT 594.01 BG 2	Brooklyn	2
CT 594.01 BG 4	Brooklyn	3
CT 594.01 BG 5	Brooklyn	2
CT 598 BG 1	Brooklyn	2
CT 60 BG 1	Brooklyn	3
CT 60 BG 2	Brooklyn	3
CT 606 BG 2	Brooklyn	3
CT 608 BG 1	Brooklyn	2
CT 608 BG 2	Brooklyn	2
CT 610.03 BG 1	Brooklyn	3
CT 610.03 BG 2	Brooklyn	1
CT 610.04 BG 1	Brooklyn	2
CT 610.04 BG 2	Brooklyn	2
CT 610.04 BG 4	Brooklyn	2
CT 610.04 BG 5	Brooklyn	2
CT 62 BG 2	Brooklyn	2
CT 626 BG 1	Brooklyn	3
CT 626 BG 2	Brooklyn	1
CT 650 BG 1	Brooklyn	3
CT 650 BG 2	Brooklyn	1
CT 66 BG 2	Brooklyn	2
CT 670 BG 1	Brooklyn	3
CT 670 BG 2	Brooklyn	3
CT 672 BG 1	Brooklyn	3
CT 674 BG 1	Brooklyn	1
CT 674 BG 2	Brooklyn	3
CT 676 BG 1	Brooklyn	3
CT 676 BG 2	Brooklyn	3
CT 678 BG 1	Brooklyn	3
CT 678 BG 2	Brooklyn	3
CT 68 BG 1	Brooklyn	1
CT 68 BG 2	Brooklyn	2
CT 68 BG 4	Brooklyn	1
CT 680 BG 1	Brooklyn	3
CT 680 BG 2	Brooklyn	3
CT 682 BG 1	Brooklyn	3
CT 682 BG 2	Brooklyn	3
CT 686 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 688 BG 1	Brooklyn	3
CT 688 BG 2	Brooklyn	3
CT 690 BG 1	Brooklyn	3
CT 690 BG 2	Brooklyn	3
CT 692 BG 1	Brooklyn	3
CT 692 BG 2	Brooklyn	3
CT 696.01 BG 2	Brooklyn	3
CT 696.02 BG 2	Brooklyn	3
CT 70 BG 1	Brooklyn	3
CT 71 BG 2	Brooklyn	3
CT 71 BG 3	Brooklyn	1
CT 71 BG 4	Brooklyn	1
CT 72 BG 1	Brooklyn	1
CT 720 BG 1	Brooklyn	3
CT 722 BG 1	Brooklyn	3
CT 722 BG 2	Brooklyn	3
CT 724 BG 1	Brooklyn	3
CT 724 BG 2	Brooklyn	3
CT 726 BG 1	Brooklyn	3
CT 728 BG 1	Brooklyn	3
CT 728 BG 2	Brooklyn	3
CT 730 BG 1	Brooklyn	3
CT 730 BG 2	Brooklyn	3
CT 732 BG 1	Brooklyn	3
CT 732 BG 2	Brooklyn	3
CT 734 BG 1	Brooklyn	3
CT 734 BG 2	Brooklyn	3
CT 736 BG 1	Brooklyn	1
CT 736 BG 2	Brooklyn	3
CT 736 BG 3	Brooklyn	1
CT 738 BG 1	Brooklyn	1
CT 738 BG 2	Brooklyn	3
CT 738 BG 3	Brooklyn	1
CT 74 BG 1	Brooklyn	1
CT 74 BG 2	Brooklyn	1
CT 74 BG 3	Brooklyn	1
CT 74 BG 4	Brooklyn	1
CT 740 BG 1	Brooklyn	3
CT 740 BG 2	Brooklyn	3
CT 742 BG 1	Brooklyn	3
CT 742 BG 2	Brooklyn	3
CT 76 BG 1	Brooklyn	1
CT 76 BG 2	Brooklyn	1
CT 76 BG 3	Brooklyn	1
CT 762 BG 1	Brooklyn	1
CT 762 BG 2	Brooklyn	1
CT 762 BG 3	Brooklyn	2
CT 764 BG 1	Brooklyn	3
CT 764 BG 2	Brooklyn	1
CT 764 BG 3	Brooklyn	3
CT 766 BG 1	Brooklyn	3
CT 768 BG 1	Brooklyn	2
CT 768 BG 2	Brooklyn	2
CT 770 BG 1	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 770 BG 2	Brooklyn	1
CT 772 BG 1	Brooklyn	3
CT 774 BG 1	Brooklyn	1
CT 774 BG 2	Brooklyn	3
CT 776 BG 1	Brooklyn	3
CT 776 BG 2	Brooklyn	3
CT 776 BG 3	Brooklyn	3
CT 78 BG 1	Brooklyn	1
CT 78 BG 2	Brooklyn	1
CT 78 BG 3	Brooklyn	1
CT 78 BG 4	Brooklyn	1
CT 780 BG 1	Brooklyn	3
CT 780 BG 2	Brooklyn	3
CT 782 BG 1	Brooklyn	3
CT 782 BG 2	Brooklyn	1
CT 784 BG 1	Brooklyn	3
CT 784 BG 2	Brooklyn	3
CT 786 BG 1	Brooklyn	1
CT 786 BG 2	Brooklyn	1
CT 786 BG 3	Brooklyn	3
CT 788 BG 1	Brooklyn	1
CT 788 BG 2	Brooklyn	1
CT 788 BG 3	Brooklyn	3
CT 790 BG 1	Brooklyn	3
CT 790 BG 2	Brooklyn	1
CT 790 BG 3	Brooklyn	3
CT 790 BG 4	Brooklyn	3
CT 792 BG 1	Brooklyn	1
CT 792 BG 2	Brooklyn	3
CT 792 BG 3	Brooklyn	1
CT 794 BG 1	Brooklyn	1
CT 794 BG 2	Brooklyn	1
CT 796.01 BG 1	Brooklyn	3
CT 796.01 BG 2	Brooklyn	3
CT 796.02 BG 1	Brooklyn	1
CT 796.02 BG 2	Brooklyn	3
CT 798.01 BG 1	Brooklyn	3
CT 798.01 BG 2	Brooklyn	3
CT 798.02 BG 1	Brooklyn	1
CT 798.02 BG 2	Brooklyn	3
CT 798.02 BG 3	Brooklyn	3
CT 80 BG 1	Brooklyn	3
CT 80 BG 2	Brooklyn	3
CT 80 BG 3	Brooklyn	1
CT 800 BG 1	Brooklyn	3
CT 800 BG 2	Brooklyn	3
CT 800 BG 3	Brooklyn	3
CT 802 BG 1	Brooklyn	1
CT 802 BG 2	Brooklyn	3
CT 802 BG 3	Brooklyn	3
CT 804 BG 1	Brooklyn	1
CT 804 BG 2	Brooklyn	3
CT 804 BG 3	Brooklyn	3
CT 806 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 806 BG 2	Brooklyn	3
CT 808 BG 1	Brooklyn	1
CT 810 BG 1	Brooklyn	3
CT 810 BG 2	Brooklyn	1
CT 814 BG 1	Brooklyn	1
CT 814 BG 2	Brooklyn	3
CT 816 BG 1	Brooklyn	3
CT 816 BG 2	Brooklyn	1
CT 818 BG 1	Brooklyn	3
CT 818 BG 2	Brooklyn	3
CT 818 BG 3	Brooklyn	3
CT 82 BG 1	Brooklyn	3
CT 82 BG 2	Brooklyn	1
CT 82 BG 3	Brooklyn	1
CT 820 BG 1	Brooklyn	1
CT 820 BG 2	Brooklyn	1
CT 820 BG 3	Brooklyn	1
CT 822 BG 1	Brooklyn	3
CT 822 BG 2	Brooklyn	1
CT 822 BG 3	Brooklyn	1
CT 822 BG 4	Brooklyn	1
CT 824 BG 1	Brooklyn	1
CT 824 BG 2	Brooklyn	3
CT 824 BG 3	Brooklyn	3
CT 824 BG 4	Brooklyn	3
CT 826 BG 1	Brooklyn	3
CT 826 BG 2	Brooklyn	3
CT 826 BG 3	Brooklyn	3
CT 826 BG 4	Brooklyn	3
CT 828 BG 1	Brooklyn	1
CT 828 BG 2	Brooklyn	3
CT 828 BG 3	Brooklyn	3
CT 830 BG 1	Brooklyn	3
CT 830 BG 2	Brooklyn	3
CT 830 BG 3	Brooklyn	3
CT 830 BG 4	Brooklyn	1
CT 832 BG 1	Brooklyn	3
CT 832 BG 2	Brooklyn	3
CT 834 BG 1	Brooklyn	3
CT 834 BG 2	Brooklyn	3
CT 836 BG 1	Brooklyn	3
CT 836 BG 2	Brooklyn	3
CT 838 BG 1	Brooklyn	3
CT 838 BG 2	Brooklyn	3
CT 84 BG 1	Brooklyn	1
CT 84 BG 2	Brooklyn	1
CT 84 BG 3	Brooklyn	1
CT 840 BG 1	Brooklyn	3
CT 840 BG 2	Brooklyn	3
CT 846 BG 1	Brooklyn	3
CT 846 BG 2	Brooklyn	3
CT 848 BG 1	Brooklyn	3
CT 848 BG 2	Brooklyn	3
CT 85 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 85 BG 2	Brooklyn	1
CT 85 BG 3	Brooklyn	1
CT 850 BG 1	Brooklyn	3
CT 854 BG 1	Brooklyn	1
CT 854 BG 2	Brooklyn	3
CT 856 BG 1	Brooklyn	3
CT 856 BG 2	Brooklyn	3
CT 856 BG 3	Brooklyn	3
CT 858 BG 1	Brooklyn	3
CT 858 BG 2	Brooklyn	3
CT 860 BG 1	Brooklyn	1
CT 860 BG 2	Brooklyn	3
CT 860 BG 3	Brooklyn	3
CT 862 BG 1	Brooklyn	3
CT 862 BG 2	Brooklyn	1
CT 862 BG 3	Brooklyn	1
CT 864 BG 1	Brooklyn	3
CT 864 BG 2	Brooklyn	3
CT 866 BG 1	Brooklyn	3
CT 866 BG 2	Brooklyn	1
CT 866 BG 3	Brooklyn	3
CT 868 BG 1	Brooklyn	3
CT 868 BG 2	Brooklyn	1
CT 868 BG 3	Brooklyn	1
CT 870 BG 1	Brooklyn	1
CT 870 BG 2	Brooklyn	1
CT 870 BG 3	Brooklyn	3
CT 872 BG 1	Brooklyn	1
CT 872 BG 2	Brooklyn	3
CT 872 BG 3	Brooklyn	1
CT 874.01 BG 1	Brooklyn	1
CT 874.01 BG 2	Brooklyn	1
CT 876 BG 1	Brooklyn	1
CT 876 BG 2	Brooklyn	3
CT 878 BG 1	Brooklyn	1
CT 878 BG 2	Brooklyn	3
CT 878 BG 3	Brooklyn	3
CT 88 BG 1	Brooklyn	3
CT 88 BG 2	Brooklyn	3
CT 880 BG 1	Brooklyn	3
CT 880 BG 2	Brooklyn	3
CT 880 BG 3	Brooklyn	3
CT 882 BG 1	Brooklyn	3
CT 882 BG 2	Brooklyn	3
CT 882 BG 3	Brooklyn	3
CT 882 BG 4	Brooklyn	3
CT 884 BG 1	Brooklyn	1
CT 884 BG 2	Brooklyn	3
CT 884 BG 3	Brooklyn	1
CT 886 BG 1	Brooklyn	1
CT 886 BG 2	Brooklyn	1
CT 886 BG 3	Brooklyn	1
CT 888 BG 1	Brooklyn	1
CT 888 BG 2	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 888 BG 3	Brooklyn	1
CT 890 BG 1	Brooklyn	1
CT 890 BG 2	Brooklyn	1
CT 890 BG 3	Brooklyn	1
CT 890 BG 4	Brooklyn	1
CT 890 BG 5	Brooklyn	3
CT 890 BG 6	Brooklyn	1
CT 892 BG 1	Brooklyn	3
CT 892 BG 2	Brooklyn	1
CT 892 BG 3	Brooklyn	1
CT 892 BG 4	Brooklyn	1
CT 894 BG 1	Brooklyn	3
CT 894 BG 2	Brooklyn	1
CT 894 BG 3	Brooklyn	1
CT 894 BG 4	Brooklyn	1
CT 896 BG 1	Brooklyn	3
CT 896 BG 2	Brooklyn	3
CT 896 BG 3	Brooklyn	1
CT 898 BG 1	Brooklyn	3
CT 898 BG 2	Brooklyn	1
CT 90 BG 1	Brooklyn	1
CT 90 BG 2	Brooklyn	1
CT 900 BG 1	Brooklyn	3
CT 900 BG 2	Brooklyn	1
CT 900 BG 3	Brooklyn	1
CT 900 BG 4	Brooklyn	1
CT 900 BG 5	Brooklyn	1
CT 900 BG 6	Brooklyn	1
CT 900 BG 7	Brooklyn	1
CT 902 BG 1	Brooklyn	1
CT 902 BG 2	Brooklyn	1
CT 902 BG 3	Brooklyn	1
CT 902 BG 4	Brooklyn	3
CT 902 BG 5	Brooklyn	1
CT 906 BG 1	Brooklyn	1
CT 906 BG 2	Brooklyn	1
CT 906 BG 3	Brooklyn	1
CT 908 BG 1	Brooklyn	1
CT 908 BG 2	Brooklyn	1
CT 908 BG 3	Brooklyn	1
CT 910 BG 1	Brooklyn	1
CT 910 BG 2	Brooklyn	1
CT 910 BG 3	Brooklyn	1
CT 910 BG 4	Brooklyn	1
CT 912 BG 1	Brooklyn	1
CT 912 BG 2	Brooklyn	1
CT 912 BG 3	Brooklyn	1
CT 916 BG 1	Brooklyn	1
CT 916 BG 2	Brooklyn	1
CT 916 BG 3	Brooklyn	3
CT 916 BG 4	Brooklyn	1
CT 918 BG 1	Brooklyn	1
CT 918 BG 2	Brooklyn	3
CT 92 BG 1	Brooklyn	1

Census Tract & Block Group ID	Place Name	Category
CT 92 BG 2	Brooklyn	1
CT 92 BG 3	Brooklyn	1
CT 920 BG 1	Brooklyn	1
CT 920 BG 2	Brooklyn	1
CT 920 BG 3	Brooklyn	3
CT 922 BG 1	Brooklyn	3
CT 922 BG 2	Brooklyn	1
CT 924 BG 1	Brooklyn	1
CT 924 BG 2	Brooklyn	1
CT 924 BG 3	Brooklyn	1
CT 928 BG 1	Brooklyn	3
CT 928 BG 2	Brooklyn	3
CT 930 BG 1	Brooklyn	3
CT 930 BG 2	Brooklyn	3
CT 932 BG 1	Brooklyn	3
CT 934 BG 1	Brooklyn	3
CT 934 BG 2	Brooklyn	3
CT 936 BG 1	Brooklyn	3
CT 936 BG 2	Brooklyn	3
CT 938 BG 1	Brooklyn	3
CT 938 BG 2	Brooklyn	3
CT 94 BG 1	Brooklyn	1
CT 94 BG 2	Brooklyn	1
CT 94 BG 3	Brooklyn	1
CT 944.01 BG 1	Brooklyn	3
CT 944.01 BG 2	Brooklyn	3
CT 944.01 BG 3	Brooklyn	3
CT 944.01 BG 4	Brooklyn	3
CT 944.02 BG 1	Brooklyn	1
CT 946 BG 1	Brooklyn	3
CT 946 BG 2	Brooklyn	3
CT 946 BG 3	Brooklyn	3
CT 950 BG 1	Brooklyn	3
CT 950 BG 2	Brooklyn	3
CT 954 BG 1	Brooklyn	3
CT 954 BG 2	Brooklyn	3
CT 954 BG 3	Brooklyn	3

Census Tract & Block Group ID	Place Name	Category
CT 956 BG 1	Brooklyn	3
CT 956 BG 2	Brooklyn	3
CT 958 BG 1	Brooklyn	3
CT 958 BG 2	Brooklyn	3
CT 96 BG 1	Brooklyn	1
CT 96 BG 2	Brooklyn	1
CT 96 BG 3	Brooklyn	1
CT 96 BG 4	Brooklyn	1
CT 962 BG 1	Brooklyn	3
CT 964 BG 1	Brooklyn	3
CT 964 BG 2	Brooklyn	3
CT 966 BG 1	Brooklyn	3
CT 966 BG 2	Brooklyn	3
CT 968 BG 1	Brooklyn	3
CT 968 BG 2	Brooklyn	3
CT 970 BG 1	Brooklyn	3
CT 970 BG 2	Brooklyn	3
CT 974 BG 1	Brooklyn	1
CT 974 BG 2	Brooklyn	3
CT 98 BG 1	Brooklyn	1
CT 98 BG 2	Brooklyn	1
CT 98 BG 3	Brooklyn	1
CT 98 BG 4	Brooklyn	1
CT 982 BG 1	Brooklyn	1
CT 982 BG 2	Brooklyn	1
CT 984 BG 1	Brooklyn	3
CT 986 BG 1	Brooklyn	3
CT 986 BG 2	Brooklyn	3
CT 988 BG 1	Brooklyn	3
CT 988 BG 2	Brooklyn	3
CT 990 BG 1	Brooklyn	3
CT 992 BG 1	Brooklyn	3
CT 994 BG 1	Brooklyn	3
CT 996 BG 1	Brooklyn	3
CT 996 BG 2	Brooklyn	3
CT 998 BG 1	Brooklyn	3
CT 998 BG 2	Brooklyn	3

Table G-EJ15. Census Tracts (CT) and Block Groups (BG) in Richmond County, New York (County ID 36-085) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 105 BG 1	Staten Island	1
CT 105 BG 4	Staten Island	1
CT 105 BG 5	Staten Island	3
CT 11 BG 1	Staten Island	1
CT 11 BG 2	Staten Island	1
CT 11 BG 3	Staten Island	1

Census Tract & Block Group ID	Place Name	Category
CT 112.01 BG 2	Staten Island	2
CT 112.02 BG 2	Staten Island	1
CT 112.02 BG 3	Staten Island	3
CT 112.02 BG 4	Staten Island	1
CT 114.01 BG 2	Staten Island	1
CT 121 BG 2	Staten Island	1

Census Tract & Block Group ID	Place Name	Category
CT 125 BG 1	Staten Island	1
CT 125 BG 2	Staten Island	1
CT 128.04 BG 2	Staten Island	2
CT 128.05 BG 1	Staten Island	2
CT 128.06 BG 2	Staten Island	2
CT 128.06 BG 3	Staten Island	1
CT 132.03 BG 2	Staten Island	1
CT 132.04 BG 3	Staten Island	2
CT 133.01 BG 1	Staten Island	1
CT 133.02 BG 1	Staten Island	1
CT 133.02 BG 2	Staten Island	1
CT 133.02 BG 3	Staten Island	1
CT 134 BG 1	Staten Island	1
CT 138 BG 3	Staten Island	2
CT 138 BG 4	Staten Island	2
CT 141 BG 1	Staten Island	3
CT 141 BG 2	Staten Island	3
CT 146.04 BG 2	Staten Island	2
CT 151 BG 1	Staten Island	1
CT 151 BG 2	Staten Island	2
CT 151 BG 3	Staten Island	3
CT 156.02 BG 1	Staten Island	2
CT 156.03 BG 1	Staten Island	2
CT 156.03 BG 2	Staten Island	2
CT 169.01 BG 2	Staten Island	2
CT 17 BG 1	Staten Island	1
CT 17 BG 2	Staten Island	1
CT 170.07 BG 2	Staten Island	3
CT 170.09 BG 1	Staten Island	2
CT 170.1 BG 2	Staten Island	2
CT 170.1 BG 3	Staten Island	2
CT 170.12 BG 3	Staten Island	2
CT 173 BG 1	Staten Island	3
CT 173 BG 2	Staten Island	1
CT 176 BG 3	Staten Island	2
CT 181 BG 1	Staten Island	2
CT 187.01 BG 1	Staten Island	3
CT 187.02 BG 1	Staten Island	3
CT 187.02 BG 3	Staten Island	3
CT 187.02 BG 4	Staten Island	1
CT 189.01 BG 2	Staten Island	2
CT 189.02 BG 1	Staten Island	1
CT 189.02 BG 3	Staten Island	1
CT 198 BG 4	Staten Island	2
CT 20.01 BG 1	Staten Island	1
CT 20.02 BG 2	Staten Island	2
CT 201 BG 1	Staten Island	3
CT 201 BG 2	Staten Island	3
CT 207 BG 1	Staten Island	1
CT 207 BG 2	Staten Island	1
CT 207 BG 3	Staten Island	3
CT 207 BG 4	Staten Island	1
CT 208.01 BG 1	Staten Island	2
CT 208.01 BG 3	Staten Island	2
CT 208.03 BG 1	Staten Island	2
CT 21 BG 1	Staten Island	1
CT 21 BG 2	Staten Island	3
CT 21 BG 3	Staten Island	1
CT 213 BG 1	Staten Island	1
CT 213 BG 2	Staten Island	1
CT 213 BG 3	Staten Island	1
CT 213 BG 4	Staten Island	1
CT 213 BG 5	Staten Island	1
CT 223 BG 1	Staten Island	1
CT 223 BG 2	Staten Island	1
CT 226 BG 1	Staten Island	2
CT 231 BG 1	Staten Island	1
CT 231 BG 2	Staten Island	1
CT 239 BG 1	Staten Island	1
CT 239 BG 2	Staten Island	1
CT 247 BG 1	Staten Island	1
CT 247 BG 2	Staten Island	3
CT 248 BG 3	Staten Island	2
CT 27 BG 1	Staten Island	1
CT 273.01 BG 1	Staten Island	1
CT 273.01 BG 2	Staten Island	3
CT 273.02 BG 2	Staten Island	2
CT 277.02 BG 2	Staten Island	1
CT 277.02 BG 3	Staten Island	3
CT 277.05 BG 1	Staten Island	2
CT 277.05 BG 2	Staten Island	2
CT 277.06 BG 1	Staten Island	3
CT 277.06 BG 2	Staten Island	1
CT 277.06 BG 3	Staten Island	3
CT 29 BG 1	Staten Island	1
CT 29 BG 2	Staten Island	1
CT 29 BG 3	Staten Island	1
CT 29 BG 4	Staten Island	3
CT 291.02 BG 1	Staten Island	3
CT 291.02 BG 2	Staten Island	3
CT 291.03 BG 1	Staten Island	2
CT 291.03 BG 3	Staten Island	1
CT 291.04 BG 1	Staten Island	3
CT 291.04 BG 4	Staten Island	1
CT 3 BG 1	Staten Island	1
CT 3 BG 2	Staten Island	1
CT 303.01 BG 1	Staten Island	3
CT 303.01 BG 2	Staten Island	3
CT 303.02 BG 1	Staten Island	3
CT 303.02 BG 2	Staten Island	3
CT 303.02 BG 3	Staten Island	1
CT 303.02 BG 4	Staten Island	3
CT 319.01 BG 1	Staten Island	1
CT 319.01 BG 2	Staten Island	3
CT 319.02 BG 1	Staten Island	1
CT 319.02 BG 2	Staten Island	1
CT 319.02 BG 3	Staten Island	1
CT 323 BG 1	Staten Island	1

Census Tract & Block Group ID	Place Name	Category
CT 33 BG 1	Staten Island	1
CT 33 BG 2	Staten Island	3
CT 36 BG 1	Staten Island	3
CT 36 BG 2	Staten Island	1
CT 39 BG 1	Staten Island	2
CT 39 BG 2	Staten Island	3
CT 40 BG 1	Staten Island	1
CT 40 BG 2	Staten Island	1
CT 40 BG 3	Staten Island	1
CT 40 BG 4	Staten Island	3
CT 40 BG 5	Staten Island	3
CT 40 BG 6	Staten Island	1
CT 40 BG 7	Staten Island	1
CT 50 BG 2	Staten Island	1
CT 50 BG 3	Staten Island	1
CT 59 BG 1	Staten Island	2
CT 59 BG 2	Staten Island	2
CT 6 BG 1	Staten Island	1
CT 6 BG 2	Staten Island	1
CT 64 BG 2	Staten Island	2
CT 64 BG 3	Staten Island	1
CT 7 BG 1	Staten Island	1
CT 7 BG 2	Staten Island	1

Census Tract & Block Group ID	Place Name	Category
CT 7 BG 3	Staten Island	1
CT 7 BG 4	Staten Island	1
CT 70 BG 1	Staten Island	2
CT 70 BG 2	Staten Island	3
CT 70 BG 3	Staten Island	2
CT 74 BG 1	Staten Island	1
CT 74 BG 2	Staten Island	1
CT 75 BG 1	Staten Island	1
CT 75 BG 2	Staten Island	3
CT 75 BG 3	Staten Island	1
CT 77 BG 1	Staten Island	1
CT 8 BG 1	Staten Island	1
CT 8 BG 2	Staten Island	1
CT 8 BG 3	Staten Island	3
CT 81 BG 1	Staten Island	1
CT 81 BG 2	Staten Island	3
CT 81 BG 3	Staten Island	1
CT 9 BG 1	Staten Island	1
CT 9 BG 2	Staten Island	1
CT 97 BG 1	Staten Island	1
CT 97 BG 2	Staten Island	3
CT 97 BG 3	Staten Island	3

Table G-EJ16. Census Tracts (CT) and Block Groups (BG) in Hudson County, New Jersey (County ID 34-017) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 1 BG 1	Jersey City	1
CT 1 BG 2	Jersey City	1
CT 1 BG 3	Jersey City	3
CT 10 BG 1	Jersey City	3
CT 10 BG 2	Jersey City	1
CT 101 BG 1	Bayonne	1
CT 101 BG 2	Bayonne	1
CT 101 BG 3	Bayonne	1
CT 101 BG 4	Bayonne	3
CT 102 BG 3	Bayonne	1
CT 103 BG 1	Bayonne	2
CT 103 BG 2	Bayonne	2
CT 103 BG 3	Bayonne	1
CT 104 BG 1	Bayonne	3
CT 104 BG 2	Bayonne	3
CT 104 BG 3	Bayonne	3
CT 105 BG 1	Bayonne	3
CT 105 BG 2	Bayonne	2
CT 105 BG 4	Bayonne	3
CT 106 BG 2	Bayonne	1
CT 106 BG 3	Bayonne	1

Census Tract & Block Group ID	Place Name	Category
CT 106 BG 4	Bayonne	1
CT 107 BG 2	Bayonne	1
CT 107 BG 3	Bayonne	2
CT 108 BG 1	Bayonne	3
CT 108 BG 2	Bayonne	3
CT 108 BG 3	Bayonne	2
CT 109 BG 1	Bayonne	1
CT 11 BG 1	Jersey City	3
CT 11 BG 2	Jersey City	3
CT 11 BG 3	Jersey City	3
CT 110 BG 1	Bayonne	1
CT 111 BG 1	Bayonne	1
CT 111 BG 2	Bayonne	1
CT 111 BG 3	Bayonne	1
CT 112 BG 1	Bayonne	2
CT 112 BG 2	Bayonne	3
CT 113 BG 1	Bayonne	1
CT 113 BG 2	Bayonne	1
CT 113 BG 3	Bayonne	3
CT 114 BG 1	Bayonne	3
CT 115 BG 1	Bayonne	3

Census Tract & Block Group ID	Place Name	Category
CT 116 BG 1	Bayonne	2
CT 116 BG 2	Bayonne	3
CT 116 BG 4	Bayonne	3
CT 12.01 BG 1	Jersey City	1
CT 12.02 BG 1	Jersey City	1
CT 123 BG 1	Kearny	3
CT 123 BG 2	Kearny	1
CT 125 BG 1	Kearny	3
CT 125 BG 3	Kearny	3
CT 126 BG 1	Kearny	3
CT 126 BG 2	Kearny	3
CT 126 BG 3	Kearny	1
CT 127 BG 1	Kearny	3
CT 127 BG 3	Kearny	3
CT 127 BG 5	Kearny	3
CT 128 BG 1	Kearny	3
CT 128 BG 2	Kearny	3
CT 128 BG 3	Kearny	1
CT 129 BG 1	Kearny	3
CT 129 BG 2	Kearny	1
CT 13 BG 1	Jersey City	1
CT 13 BG 2	Jersey City	1
CT 130 BG 1	Kearny	3
CT 130 BG 2	Kearny	1
CT 130 BG 3	Kearny	3
CT 131 BG 1	Kearny	1
CT 132 BG 1	Kearny	1
CT 132 BG 2	Kearny	1
CT 132 BG 3	Kearny	1
CT 133 BG 1	Kearny	3
CT 133 BG 2	Kearny	1
CT 133 BG 3	Kearny	3
CT 134 BG 1	East Newark	1
CT 134 BG 2	East Newark	1
CT 135 BG 1	Harrison	1
CT 135 BG 2	Harrison	1
CT 135 BG 3	Harrison	2
CT 136 BG 1	Harrison	1
CT 136 BG 2	Harrison	1
CT 137 BG 1	Harrison	1
CT 137 BG 2	Harrison	1
CT 138 BG 1	Harrison	3
CT 139 BG 1	Harrison	3
CT 139 BG 2	Harrison	3
CT 14 BG 1	Jersey City	1
CT 14 BG 2	Jersey City	1
CT 140 BG 1	North Bergen	1
CT 140 BG 2	North Bergen	3
CT 140 BG 3	North Bergen	3
CT 140 BG 4	North Bergen	1
CT 141.01 BG 1	North Bergen	3
CT 141.01 BG 2	North Bergen	3
CT 141.02 BG 1	North Bergen	3
CT 141.02 BG 2	North Bergen	3
CT 141.02 BG 3	North Bergen	3
CT 141.02 BG 4	North Bergen	3
CT 142 BG 1	North Bergen	1
CT 142 BG 2	North Bergen	3
CT 142 BG 3	North Bergen	1
CT 142 BG 4	North Bergen	1
CT 143 BG 1	North Bergen	3
CT 143 BG 2	North Bergen	3
CT 143 BG 3	North Bergen	1
CT 143 BG 4	North Bergen	3
CT 144 BG 1	North Bergen	3
CT 144 BG 2	North Bergen	3
CT 144 BG 3	North Bergen	3
CT 144 BG 4	North Bergen	3
CT 144 BG 5	North Bergen	1
CT 145.01 BG 1	North Bergen	1
CT 145.01 BG 2	North Bergen	1
CT 145.01 BG 3	North Bergen	1
CT 145.02 BG 1	North Bergen	1
CT 145.02 BG 2	North Bergen	1
CT 145.02 BG 3	North Bergen	1
CT 146 BG 1	North Bergen	3
CT 146 BG 2	North Bergen	3
CT 147 BG 1	North Bergen	1
CT 147 BG 2	North Bergen	3
CT 147 BG 3	North Bergen	1
CT 148 BG 1	North Bergen	3
CT 148 BG 2	North Bergen	1
CT 148 BG 3	North Bergen	1
CT 149 BG 1	North Bergen	3
CT 149 BG 2	North Bergen	3
CT 150.01 BG 1	Guttenberg	3
CT 150.02 BG 1	Guttenberg	1
CT 150.02 BG 2	Guttenberg	1
CT 150.02 BG 3	Guttenberg	1
CT 151 BG 1	Guttenberg	1
CT 151 BG 2	Guttenberg	3
CT 152.01 BG 1	West New York	3
CT 152.01 BG 2	West New York	3
CT 152.02 BG 1	West New York	1
CT 152.02 BG 2	West New York	3
CT 152.02 BG 3	West New York	1
CT 152.02 BG 4	West New York	1
CT 153 BG 1	West New York	1
CT 153 BG 2	West New York	1
CT 153 BG 3	West New York	1
CT 155 BG 1	West New York	3
CT 155 BG 2	West New York	1
CT 155 BG 3	West New York	1
CT 156 BG 1	West New York	1
CT 156 BG 2	West New York	1
CT 157 BG 1	West New York	1
CT 157 BG 2	West New York	1
CT 158.01 BG 1	West New York	3

Census Tract & Block Group ID	Place Name	Category
CT 158.01 BG 2	West New York	3
CT 158.02 BG 1	West New York	3
CT 158.02 BG 2	West New York	1
CT 158.02 BG 3	West New York	1
CT 159 BG 1	West New York	1
CT 159 BG 2	West New York	1
CT 159 BG 3	West New York	1
CT 159 BG 4	West New York	1
CT 160 BG 1	West New York	3
CT 160 BG 2	West New York	1
CT 161 BG 1	Union City	1
CT 161 BG 2	Union City	1
CT 162 BG 1	Union City	1
CT 162 BG 2	Union City	1
CT 162 BG 3	Union City	1
CT 163 BG 1	Union City	3
CT 163 BG 2	Union City	1
CT 163 BG 3	Union City	1
CT 164 BG 1	Union City	1
CT 164 BG 2	Union City	1
CT 164 BG 3	Union City	1
CT 165 BG 1	Union City	1
CT 165 BG 2	Union City	1
CT 165 BG 3	Union City	3
CT 166 BG 1	Union City	1
CT 166 BG 2	Union City	1
CT 167 BG 1	Union City	1
CT 168 BG 1	Union City	1
CT 168 BG 2	Union City	1
CT 168 BG 3	Union City	1
CT 169 BG 1	Union City	1
CT 169 BG 2	Union City	1
CT 17.01 BG 1	Jersey City	1
CT 17.01 BG 2	Jersey City	1
CT 170 BG 1	Union City	1
CT 170 BG 2	Union City	1
CT 170 BG 3	Union City	1
CT 171 BG 1	Union City	3
CT 171 BG 2	Union City	1
CT 171 BG 3	Union City	1
CT 171 BG 4	Union City	1
CT 172 BG 1	Union City	1
CT 172 BG 2	Union City	1
CT 173 BG 1	Union City	1
CT 174 BG 1	Union City	1
CT 174 BG 2	Union City	1
CT 175 BG 1	Union City	1
CT 175 BG 2	Union City	1
CT 176 BG 1	Union City	1
CT 176 BG 2	Union City	1
CT 177 BG 1	Union City	1
CT 177 BG 2	Union City	1
CT 178 BG 1	Union City	3
CT 178 BG 2	Union City	1

Census Tract & Block Group ID	Place Name	Category
CT 178 BG 3	Union City	1
CT 178 BG 4	Union City	1
CT 18 BG 1	Jersey City	1
CT 18 BG 2	Jersey City	1
CT 180 BG 1	Weehawken	1
CT 180 BG 2	Weehawken	3
CT 181 BG 1	Weehawken	3
CT 181 BG 2	Weehawken	1
CT 182 BG 2	Weehawken	1
CT 184 BG 3	Hoboken	2
CT 185 BG 4	Hoboken	3
CT 187.02 BG 4	Hoboken	2
CT 19 BG 1	Jersey City	1
CT 190 BG 3	Hoboken	1
CT 190 BG 4	Hoboken	1
CT 193 BG 2	Hoboken	2
CT 198 BG 1	Secaucus	3
CT 199 BG 1	Secaucus	3
CT 199 BG 3	Secaucus	1
CT 2 BG 1	Jersey City	1
CT 2 BG 2	Jersey City	3
CT 2 BG 3	Jersey City	1
CT 20 BG 1	Jersey City	3
CT 20 BG 2	Jersey City	1
CT 20 BG 3	Jersey City	1
CT 200 BG 4	Secaucus	2
CT 201 BG 1	Secaucus	3
CT 22 BG 1	Jersey City	3
CT 23 BG 2	Jersey City	3
CT 27 BG 1	Jersey City	1
CT 27 BG 2	Jersey City	1
CT 27 BG 3	Jersey City	1
CT 28 BG 1	Jersey City	1
CT 28 BG 3	Jersey City	3
CT 28 BG 4	Jersey City	3
CT 28 BG 5	Jersey City	1
CT 29 BG 1	Jersey City	3
CT 29 BG 2	Jersey City	2
CT 29 BG 3	Jersey City	1
CT 3 BG 1	Jersey City	1
CT 3 BG 2	Jersey City	1
CT 3 BG 3	Jersey City	3
CT 30 BG 1	Jersey City	1
CT 30 BG 2	Jersey City	3
CT 31 BG 1	Jersey City	1
CT 31 BG 2	Jersey City	1
CT 31 BG 3	Jersey City	3
CT 324 BG 1	West New York	1
CT 324 BG 2	West New York	1
CT 324 BG 3	West New York	1
CT 324 BG 4	West New York	1
CT 35 BG 2	Jersey City	1
CT 4 BG 1	Jersey City	3
CT 4 BG 2	Jersey City	1

Census Tract & Block Group ID	Place Name	Category
CT 40 BG 1	Jersey City	3
CT 40 BG 2	Jersey City	3
CT 40 BG 3	Jersey City	3
CT 40 BG 4	Jersey City	3
CT 41.01 BG 1	Jersey City	3
CT 41.01 BG 2	Jersey City	3
CT 41.01 BG 3	Jersey City	1
CT 41.01 BG 4	Jersey City	3
CT 41.02 BG 1	Jersey City	1
CT 41.02 BG 2	Jersey City	3
CT 42 BG 1	Jersey City	1
CT 42 BG 2	Jersey City	1
CT 42 BG 3	Jersey City	3
CT 43 BG 1	Jersey City	3
CT 43 BG 2	Jersey City	1
CT 44 BG 1	Jersey City	1
CT 45 BG 1	Jersey City	1
CT 45 BG 2	Jersey City	1
CT 45 BG 3	Jersey City	1
CT 46 BG 1	Jersey City	1
CT 46 BG 2	Jersey City	1
CT 47 BG 1	Jersey City	3
CT 47 BG 2	Jersey City	1
CT 48 BG 1	Jersey City	1
CT 48 BG 2	Jersey City	1
CT 48 BG 3	Jersey City	1
CT 49 BG 1	Jersey City	3
CT 49 BG 2	Jersey City	1
CT 49 BG 3	Jersey City	1
CT 49 BG 4	Jersey City	3
CT 5 BG 1	Jersey City	1
CT 5 BG 2	Jersey City	1
CT 5 BG 3	Jersey City	1
CT 52 BG 1	Jersey City	1
CT 52 BG 2	Jersey City	3
CT 53 BG 1	Jersey City	1
CT 53 BG 2	Jersey City	1
CT 54 BG 1	Jersey City	3
CT 54 BG 2	Jersey City	1
CT 54 BG 3	Jersey City	1
CT 55 BG 1	Jersey City	1
CT 56 BG 1	Jersey City	1
CT 56 BG 2	Jersey City	3
CT 56 BG 3	Jersey City	3
CT 58.01 BG 1	Jersey City	1
CT 58.01 BG 2	Jersey City	1
CT 58.01 BG 3	Jersey City	1
CT 58.01 BG 4	Jersey City	1
CT 59 BG 1	Jersey City	3
CT 59 BG 2	Jersey City	3
CT 59 BG 3	Jersey City	3
CT 59 BG 4	Jersey City	3

Census Tract & Block Group ID	Place Name	Category
CT 59 BG 5	Jersey City	1
CT 6 BG 1	Jersey City	3
CT 6 BG 2	Jersey City	1
CT 6 BG 3	Jersey City	1
CT 6 BG 4	Jersey City	3
CT 60 BG 1	Jersey City	1
CT 60 BG 2	Jersey City	1
CT 61 BG 1	Jersey City	3
CT 61 BG 2	Jersey City	1
CT 61 BG 3	Jersey City	1
CT 61 BG 4	Jersey City	3
CT 62 BG 1	Jersey City	1
CT 62 BG 2	Jersey City	1
CT 63 BG 1	Jersey City	1
CT 63 BG 2	Jersey City	3
CT 63 BG 3	Jersey City	1
CT 64 BG 1	Jersey City	3
CT 65 BG 1	Jersey City	1
CT 65 BG 2	Jersey City	1
CT 66 BG 1	Jersey City	3
CT 67 BG 1	Jersey City	1
CT 67 BG 2	Jersey City	1
CT 67 BG 3	Jersey City	1
CT 68 BG 1	Jersey City	3
CT 68 BG 2	Jersey City	1
CT 69 BG 1	Jersey City	2
CT 7 BG 2	Jersey City	1
CT 7 BG 3	Jersey City	3
CT 70 BG 1	Jersey City	1
CT 70 BG 2	Jersey City	3
CT 70 BG 3	Jersey City	3
CT 71 BG 1	Jersey City	1
CT 71 BG 2	Jersey City	3
CT 71 BG 3	Jersey City	1
CT 72 BG 2	Jersey City	3
CT 73 BG 1	Jersey City	3
CT 75 BG 1	Jersey City	3
CT 75 BG 2	Jersey City	3
CT 75 BG 4	Jersey City	3
CT 76 BG 1	Jersey City	3
CT 76 BG 2	Jersey City	3
CT 77 BG 2	Jersey City	3
CT 77 BG 3	Jersey City	3
CT 77 BG 4	Jersey City	3
CT 78 BG 1	Jersey City	1
CT 8 BG 1	Jersey City	1
CT 8 BG 2	Jersey City	1
CT 9.02 BG 1	Jersey City	3
CT 9.02 BG 2	Jersey City	3
CT 9.02 BG 3	Jersey City	3
CT 9.02 BG 4	Jersey City	1

Table G-EJ17. Census Tracts (CT) and Block Groups (BG) in Gloucester County, New Jersey (County ID 34-015) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 5001 BG 1	Westville	2
CT 5001 BG 2	Westville	2
CT 5001 BG 3	Westville	1
CT 5001 BG 4	Westville	1
CT 5002.01 BG 2	West Deptford	2
CT 5002.02 BG 2	West Deptford	2
CT 5002.02 BG 3	West Deptford	2
CT 5002.02 BG 4	West Deptford	1
CT 5002.03 BG 2	West Deptford	2
CT 5002.03 BG 3	West Deptford	2
CT 5002.04 BG 1	West Deptford	3
CT 5002.04 BG 3	West Deptford	3
CT 5002.05 BG 2	West Deptford	2
CT 5002.05 BG 3	West Deptford	2
CT 5003 BG 1	National Park	2
CT 5003 BG 3	National Park	2
CT 5004 BG 2	Paulsboro	1
CT 5004 BG 3	Paulsboro	1
CT 5004 BG 4	Paulsboro	1
CT 5004 BG 5	Paulsboro	1
CT 5004 BG 6	Paulsboro	1
CT 5004 BG 7	Paulsboro	2
CT 5005 BG 3	Greenwich	2
CT 5005 BG 4	Greenwich	2
CT 5005 BG 5	Greenwich	2
CT 5006 BG 1	East Greenwich	3
CT 5006 BG 2	East Greenwich	2
CT 5006 BG 3	East Greenwich	3
CT 5007.01 BG 1	Mantua	2
CT 5007.01 BG 2	Mantua	2
CT 5007.01 BG 3	Mantua	2
CT 5007.01 BG 5	Mantua	2
CT 5010.01 BG 1	Woodbury	3
CT 5010.01 BG 2	Woodbury	1
CT 5010.02 BG 1	Woodbury	1
CT 5010.02 BG 2	Woodbury	3
CT 5010.02 BG 3	Woodbury	1
CT 5010.03 BG 1	Woodbury	1
CT 5010.03 BG 2	Woodbury	3
CT 5010.03 BG 3	Woodbury	1
CT 5011.01 BG 1	Deptford	1
CT 5011.01 BG 2	Deptford	1
CT 5011.01 BG 3	Deptford	2
CT 5011.02 BG 1	Deptford	3
CT 5011.02 BG 2	Deptford	1
CT 5011.03 BG 2	Deptford	2
CT 5011.03 BG 3	Deptford	3
CT 5011.04 BG 1	Deptford	1
CT 5011.04 BG 3	Deptford	1
CT 5011.05 BG 1	Deptford	1
CT 5011.06 BG 1	Deptford	1
CT 5011.06 BG 2	Deptford	2
CT 5011.06 BG 3	Deptford	1
CT 5011.07 BG 2	Deptford	1
CT 5011.07 BG 3	Deptford	2
CT 5012.04 BG 1	Washington	2
CT 5012.05 BG 1	Washington	2
CT 5012.06 BG 2	Washington	1
CT 5012.06 BG 3	Washington	2
CT 5012.08 BG 3	Washington	2
CT 5012.09 BG 1	Washington	1
CT 5012.09 BG 3	Washington	3
CT 5012.12 BG 1	Washington	1
CT 5012.13 BG 3	Washington	3
CT 5013.01 BG 2	Pitman	2
CT 5013.01 BG 3	Pitman	2
CT 5013.02 BG 1	Pitman	2
CT 5013.03 BG 1	Pitman	3
CT 5013.03 BG 2	Pitman	2
CT 5013.03 BG 3	Pitman	2
CT 5014.02 BG 1	Glassboro	1
CT 5014.02 BG 2	Glassboro	2
CT 5014.02 BG 3	Glassboro	2
CT 5014.03 BG 2	Glassboro	1
CT 5014.04 BG 1	Glassboro	3
CT 5014.04 BG 2	Glassboro	2
CT 5014.05 BG 1	Glassboro	1
CT 5014.05 BG 2	Glassboro	1
CT 5014.06 BG 1	Glassboro	1
CT 5014.06 BG 2	Glassboro	2
CT 5015 BG 1	Clayton	1
CT 5015 BG 2	Clayton	2
CT 5015 BG 4	Clayton	1
CT 5015 BG 6	Clayton	3
CT 5016.03 BG 3	Monroe	1
CT 5016.04 BG 1	Monroe	2
CT 5016.04 BG 2	Monroe	2
CT 5016.04 BG 3	Monroe	3
CT 5016.04 BG 4	Monroe	1
CT 5016.04 BG 5	Monroe	1
CT 5016.05 BG 1	Monroe	3
CT 5016.05 BG 2	Monroe	1
CT 5016.05 BG 3	Monroe	2
CT 5016.06 BG 1	Monroe	3

Census Tract & Block Group ID	Place Name	Category
CT 5016.06 BG 2	Monroe	2
CT 5016.06 BG 4	Monroe	1
CT 5016.08 BG 1	Monroe	3
CT 5016.08 BG 2	Monroe	1
CT 5016.09 BG 1	Monroe	3
CT 5016.09 BG 2	Monroe	3
CT 5017.02 BG 1	Franklin	2
CT 5017.03 BG 3	Franklin	2
CT 5017.03 BG 4	Franklin	1
CT 5017.04 BG 1	Franklin	1
CT 5017.04 BG 2	Franklin	2
CT 5017.04 BG 3	Franklin	1
CT 5018 BG 1	Newfield	2
CT 5018 BG 2	Newfield	2
CT 5019 BG 2	Elk	1
CT 5019 BG 3	Elk	2
CT 5022 BG 2	Woolwich	3
CT 5023 BG 1	Swedesboro	1
CT 5023 BG 2	Swedesboro	1
CT 5024 BG 2	Logan	2
CT 5024 BG 3	Logan	3

Table G-EJ18. Census Tracts (CT) and Block Groups (BG) in Philadelphia County, Pennsylvania (County ID 42-101) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 100 BG 1	Philadelphia	1
CT 100 BG 2	Philadelphia	1
CT 100 BG 3	Philadelphia	3
CT 100 BG 4	Philadelphia	3
CT 101 BG 1	Philadelphia	3
CT 101 BG 2	Philadelphia	3
CT 101 BG 3	Philadelphia	1
CT 101 BG 4	Philadelphia	1
CT 101 BG 5	Philadelphia	1
CT 101 BG 6	Philadelphia	3
CT 101 BG 7	Philadelphia	1
CT 102 BG 1	Philadelphia	1
CT 102 BG 2	Philadelphia	1
CT 102 BG 3	Philadelphia	1
CT 103 BG 1	Philadelphia	1
CT 103 BG 2	Philadelphia	3
CT 104 BG 1	Philadelphia	1
CT 104 BG 2	Philadelphia	1
CT 104 BG 3	Philadelphia	1
CT 104 BG 4	Philadelphia	1
CT 105 BG 1	Philadelphia	1
CT 105 BG 2	Philadelphia	1
CT 105 BG 3	Philadelphia	1
CT 106 BG 1	Philadelphia	1
CT 106 BG 2	Philadelphia	1
CT 107 BG 1	Philadelphia	1
CT 107 BG 2	Philadelphia	1
CT 107 BG 3	Philadelphia	1
CT 107 BG 4	Philadelphia	1
CT 108 BG 1	Philadelphia	1
CT 108 BG 2	Philadelphia	3
CT 108 BG 3	Philadelphia	1
CT 108 BG 4	Philadelphia	1
CT 108 BG 5	Philadelphia	1
CT 109 BG 1	Philadelphia	1
CT 109 BG 2	Philadelphia	1
CT 109 BG 3	Philadelphia	1
CT 110 BG 1	Philadelphia	1
CT 110 BG 2	Philadelphia	1
CT 110 BG 3	Philadelphia	1
CT 110 BG 4	Philadelphia	1
CT 111 BG 1	Philadelphia	1
CT 111 BG 2	Philadelphia	1
CT 111 BG 3	Philadelphia	1
CT 111 BG 4	Philadelphia	1
CT 111 BG 5	Philadelphia	1
CT 112 BG 1	Philadelphia	1
CT 112 BG 2	Philadelphia	3
CT 112 BG 3	Philadelphia	1
CT 112 BG 4	Philadelphia	1
CT 112 BG 5	Philadelphia	1
CT 112 BG 6	Philadelphia	3
CT 112 BG 7	Philadelphia	1
CT 113 BG 1	Philadelphia	3
CT 113 BG 2	Philadelphia	1
CT 113 BG 3	Philadelphia	1
CT 114 BG 1	Philadelphia	3
CT 114 BG 2	Philadelphia	3
CT 114 BG 3	Philadelphia	1
CT 114 BG 4	Philadelphia	1
CT 114 BG 5	Philadelphia	3
CT 114 BG 6	Philadelphia	3
CT 115 BG 1	Philadelphia	3
CT 115 BG 2	Philadelphia	3
CT 115 BG 3	Philadelphia	3
CT 115 BG 4	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 117 BG 1	Philadelphia	3
CT 118 BG 1	Philadelphia	3
CT 118 BG 2	Philadelphia	1
CT 118 BG 3	Philadelphia	1
CT 118 BG 4	Philadelphia	3
CT 118 BG 5	Philadelphia	1
CT 118 BG 6	Philadelphia	3
CT 119 BG 1	Philadelphia	1
CT 119 BG 2	Philadelphia	1
CT 119 BG 3	Philadelphia	1
CT 119 BG 4	Philadelphia	3
CT 119 BG 5	Philadelphia	3
CT 120 BG 1	Philadelphia	3
CT 120 BG 2	Philadelphia	3
CT 121 BG 1	Philadelphia	3
CT 121 BG 2	Philadelphia	3
CT 122.01 BG 1	Philadelphia	1
CT 122.01 BG 2	Philadelphia	1
CT 122.03 BG 1	Philadelphia	1
CT 122.04 BG 1	Philadelphia	3
CT 122.04 BG 2	Philadelphia	3
CT 13 BG 3	Philadelphia	3
CT 13 BG 4	Philadelphia	3
CT 131 BG 1	Philadelphia	1
CT 131 BG 2	Philadelphia	3
CT 132 BG 1	Philadelphia	1
CT 132 BG 2	Philadelphia	1
CT 133 BG 2	Philadelphia	1
CT 135 BG 4	Philadelphia	3
CT 137 BG 1	Philadelphia	1
CT 137 BG 2	Philadelphia	1
CT 137 BG 3	Philadelphia	1
CT 137 BG 4	Philadelphia	3
CT 137 BG 5	Philadelphia	3
CT 138 BG 1	Philadelphia	1
CT 138 BG 2	Philadelphia	1
CT 139 BG 1	Philadelphia	1
CT 139 BG 2	Philadelphia	1
CT 139 BG 3	Philadelphia	3
CT 140 BG 1	Philadelphia	1
CT 140 BG 2	Philadelphia	1
CT 140 BG 3	Philadelphia	1
CT 141 BG 1	Philadelphia	1
CT 141 BG 2	Philadelphia	1
CT 144 BG 1	Philadelphia	1
CT 144 BG 3	Philadelphia	1
CT 145 BG 1	Philadelphia	1
CT 145 BG 2	Philadelphia	1
CT 146 BG 1	Philadelphia	1
CT 146 BG 2	Philadelphia	3
CT 146 BG 3	Philadelphia	1
CT 147 BG 1	Philadelphia	1
CT 147 BG 2	Philadelphia	1
CT 148 BG 1	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 149 BG 1	Philadelphia	1
CT 149 BG 2	Philadelphia	1
CT 149 BG 3	Philadelphia	1
CT 149 BG 4	Philadelphia	1
CT 149 BG 5	Philadelphia	1
CT 149 BG 6	Philadelphia	1
CT 151.01 BG 1	Philadelphia	1
CT 151.01 BG 2	Philadelphia	1
CT 151.02 BG 1	Philadelphia	1
CT 151.02 BG 2	Philadelphia	1
CT 151.02 BG 3	Philadelphia	1
CT 152 BG 1	Philadelphia	1
CT 152 BG 2	Philadelphia	1
CT 152 BG 3	Philadelphia	1
CT 152 BG 4	Philadelphia	1
CT 152 BG 5	Philadelphia	3
CT 153 BG 1	Philadelphia	2
CT 153 BG 2	Philadelphia	1
CT 153 BG 3	Philadelphia	1
CT 153 BG 4	Philadelphia	1
CT 156 BG 1	Philadelphia	1
CT 156 BG 2	Philadelphia	1
CT 157 BG 1	Philadelphia	3
CT 157 BG 2	Philadelphia	1
CT 157 BG 3	Philadelphia	1
CT 160 BG 2	Philadelphia	2
CT 160 BG 7	Philadelphia	2
CT 161 BG 2	Philadelphia	1
CT 161 BG 3	Philadelphia	3
CT 161 BG 4	Philadelphia	1
CT 162 BG 1	Philadelphia	1
CT 162 BG 2	Philadelphia	1
CT 162 BG 3	Philadelphia	1
CT 163 BG 1	Philadelphia	1
CT 163 BG 2	Philadelphia	1
CT 163 BG 3	Philadelphia	3
CT 163 BG 4	Philadelphia	1
CT 164 BG 1	Philadelphia	1
CT 164 BG 2	Philadelphia	1
CT 164 BG 3	Philadelphia	3
CT 164 BG 4	Philadelphia	1
CT 165 BG 1	Philadelphia	1
CT 165 BG 2	Philadelphia	1
CT 165 BG 3	Philadelphia	1
CT 166 BG 1	Philadelphia	1
CT 166 BG 2	Philadelphia	1
CT 167.01 BG 1	Philadelphia	1
CT 167.01 BG 2	Philadelphia	1
CT 167.01 BG 3	Philadelphia	1
CT 167.02 BG 1	Philadelphia	1
CT 167.02 BG 2	Philadelphia	1
CT 167.02 BG 3	Philadelphia	1
CT 167.02 BG 4	Philadelphia	1
CT 168 BG 1	Philadelphia	3

Census Tract & Block Group ID	Place Name	Category
CT 168 BG 2	Philadelphia	1
CT 168 BG 3	Philadelphia	1
CT 168 BG 4	Philadelphia	1
CT 168 BG 5	Philadelphia	1
CT 168 BG 6	Philadelphia	1
CT 169.01 BG 1	Philadelphia	1
CT 169.01 BG 2	Philadelphia	1
CT 169.01 BG 3	Philadelphia	1
CT 169.02 BG 1	Philadelphia	1
CT 169.02 BG 2	Philadelphia	1
CT 169.02 BG 3	Philadelphia	1
CT 169.02 BG 4	Philadelphia	1
CT 170 BG 1	Philadelphia	3
CT 170 BG 2	Philadelphia	1
CT 170 BG 3	Philadelphia	1
CT 171 BG 1	Philadelphia	1
CT 171 BG 2	Philadelphia	1
CT 171 BG 3	Philadelphia	3
CT 171 BG 4	Philadelphia	1
CT 172.01 BG 1	Philadelphia	1
CT 172.01 BG 2	Philadelphia	1
CT 172.01 BG 3	Philadelphia	3
CT 172.02 BG 1	Philadelphia	1
CT 172.02 BG 2	Philadelphia	1
CT 172.02 BG 3	Philadelphia	1
CT 172.02 BG 4	Philadelphia	1
CT 173 BG 1	Philadelphia	1
CT 173 BG 2	Philadelphia	1
CT 174 BG 1	Philadelphia	1
CT 174 BG 2	Philadelphia	1
CT 175 BG 1	Philadelphia	1
CT 175 BG 2	Philadelphia	1
CT 175 BG 3	Philadelphia	1
CT 175 BG 4	Philadelphia	1
CT 175 BG 5	Philadelphia	1
CT 175 BG 6	Philadelphia	1
CT 176.01 BG 1	Philadelphia	1
CT 176.01 BG 2	Philadelphia	1
CT 176.01 BG 3	Philadelphia	1
CT 176.01 BG 4	Philadelphia	1
CT 176.01 BG 5	Philadelphia	1
CT 176.02 BG 1	Philadelphia	1
CT 176.02 BG 2	Philadelphia	1
CT 176.02 BG 3	Philadelphia	1
CT 177.01 BG 1	Philadelphia	1
CT 177.01 BG 2	Philadelphia	1
CT 177.01 BG 3	Philadelphia	1
CT 177.02 BG 1	Philadelphia	1
CT 177.02 BG 2	Philadelphia	1
CT 177.02 BG 3	Philadelphia	1
CT 177.02 BG 4	Philadelphia	1
CT 177.02 BG 5	Philadelphia	1
CT 178 BG 1	Philadelphia	1
CT 178 BG 2	Philadelphia	1
CT 178 BG 3	Philadelphia	1
CT 178 BG 4	Philadelphia	1
CT 178 BG 5	Philadelphia	1
CT 178 BG 6	Philadelphia	1
CT 178 BG 7	Philadelphia	1
CT 179 BG 1	Philadelphia	1
CT 179 BG 2	Philadelphia	2
CT 179 BG 3	Philadelphia	1
CT 179 BG 4	Philadelphia	2
CT 179 BG 5	Philadelphia	1
CT 180.02 BG 1	Philadelphia	2
CT 180.02 BG 3	Philadelphia	2
CT 180.02 BG 4	Philadelphia	2
CT 188 BG 1	Philadelphia	1
CT 188 BG 2	Philadelphia	1
CT 188 BG 3	Philadelphia	1
CT 188 BG 4	Philadelphia	1
CT 188 BG 5	Philadelphia	1
CT 188 BG 6	Philadelphia	1
CT 188 BG 7	Philadelphia	1
CT 19 BG 3	Philadelphia	3
CT 190 BG 1	Philadelphia	1
CT 190 BG 2	Philadelphia	1
CT 190 BG 3	Philadelphia	1
CT 190 BG 4	Philadelphia	3
CT 190 BG 5	Philadelphia	1
CT 191 BG 1	Philadelphia	1
CT 191 BG 2	Philadelphia	1
CT 191 BG 3	Philadelphia	1
CT 191 BG 4	Philadelphia	3
CT 191 BG 5	Philadelphia	1
CT 191 BG 6	Philadelphia	1
CT 192 BG 1	Philadelphia	1
CT 192 BG 2	Philadelphia	1
CT 192 BG 3	Philadelphia	1
CT 192 BG 4	Philadelphia	1
CT 192 BG 5	Philadelphia	1
CT 192 BG 6	Philadelphia	1
CT 195.01 BG 1	Philadelphia	1
CT 195.01 BG 2	Philadelphia	1
CT 195.01 BG 3	Philadelphia	1
CT 195.02 BG 1	Philadelphia	1
CT 195.02 BG 2	Philadelphia	1
CT 195.02 BG 3	Philadelphia	1
CT 197 BG 1	Philadelphia	1
CT 197 BG 2	Philadelphia	1
CT 197 BG 3	Philadelphia	1
CT 197 BG 4	Philadelphia	1
CT 197 BG 5	Philadelphia	1
CT 197 BG 6	Philadelphia	1
CT 198 BG 1	Philadelphia	1
CT 198 BG 2	Philadelphia	1
CT 198 BG 3	Philadelphia	1
CT 198 BG 4	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 198 BG 5	Philadelphia	1
CT 198 BG 6	Philadelphia	1
CT 199 BG 1	Philadelphia	1
CT 199 BG 2	Philadelphia	1
CT 199 BG 3	Philadelphia	1
CT 199 BG 4	Philadelphia	1
CT 2 BG 1	Philadelphia	1
CT 20 BG 1	Philadelphia	1
CT 20 BG 2	Philadelphia	3
CT 200 BG 1	Philadelphia	1
CT 200 BG 2	Philadelphia	1
CT 201.01 BG 1	Philadelphia	1
CT 201.01 BG 2	Philadelphia	1
CT 201.01 BG 3	Philadelphia	1
CT 201.02 BG 1	Philadelphia	3
CT 201.02 BG 2	Philadelphia	3
CT 201.02 BG 3	Philadelphia	3
CT 201.02 BG 4	Philadelphia	3
CT 202 BG 1	Philadelphia	1
CT 202 BG 2	Philadelphia	1
CT 202 BG 3	Philadelphia	1
CT 202 BG 4	Philadelphia	1
CT 202 BG 5	Philadelphia	3
CT 202 BG 6	Philadelphia	1
CT 203 BG 1	Philadelphia	1
CT 203 BG 2	Philadelphia	1
CT 204 BG 1	Philadelphia	1
CT 204 BG 2	Philadelphia	1
CT 204 BG 3	Philadelphia	3
CT 204 BG 4	Philadelphia	1
CT 205 BG 1	Philadelphia	1
CT 205 BG 2	Philadelphia	1
CT 206 BG 1	Philadelphia	3
CT 207 BG 4	Philadelphia	3
CT 208 BG 1	Philadelphia	3
CT 21 BG 1	Philadelphia	1
CT 21 BG 2	Philadelphia	3
CT 213 BG 5	Philadelphia	2
CT 214 BG 3	Philadelphia	2
CT 218 BG 2	Philadelphia	1
CT 218 BG 3	Philadelphia	3
CT 22 BG 2	Philadelphia	3
CT 22 BG 3	Philadelphia	1
CT 236 BG 2	Philadelphia	3
CT 237 BG 1	Philadelphia	1
CT 237 BG 2	Philadelphia	3
CT 237 BG 3	Philadelphia	3
CT 237 BG 4	Philadelphia	3
CT 238 BG 1	Philadelphia	3
CT 238 BG 2	Philadelphia	3
CT 238 BG 3	Philadelphia	3
CT 238 BG 4	Philadelphia	3
CT 238 BG 5	Philadelphia	3
CT 239 BG 1	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 239 BG 2	Philadelphia	3
CT 24 BG 5	Philadelphia	3
CT 240 BG 1	Philadelphia	3
CT 240 BG 2	Philadelphia	3
CT 240 BG 3	Philadelphia	1
CT 240 BG 4	Philadelphia	1
CT 241 BG 1	Philadelphia	1
CT 242 BG 1	Philadelphia	3
CT 242 BG 2	Philadelphia	1
CT 242 BG 3	Philadelphia	1
CT 242 BG 4	Philadelphia	3
CT 243 BG 1	Philadelphia	1
CT 243 BG 2	Philadelphia	1
CT 243 BG 3	Philadelphia	3
CT 243 BG 4	Philadelphia	3
CT 244 BG 1	Philadelphia	1
CT 244 BG 2	Philadelphia	1
CT 244 BG 3	Philadelphia	1
CT 245 BG 1	Philadelphia	1
CT 245 BG 2	Philadelphia	1
CT 245 BG 3	Philadelphia	1
CT 245 BG 4	Philadelphia	1
CT 246 BG 1	Philadelphia	1
CT 246 BG 2	Philadelphia	1
CT 246 BG 3	Philadelphia	1
CT 247 BG 1	Philadelphia	1
CT 247 BG 2	Philadelphia	1
CT 247 BG 3	Philadelphia	3
CT 247 BG 4	Philadelphia	1
CT 247 BG 5	Philadelphia	3
CT 248 BG 1	Philadelphia	3
CT 248 BG 2	Philadelphia	1
CT 249 BG 1	Philadelphia	1
CT 249 BG 2	Philadelphia	1
CT 249 BG 3	Philadelphia	1
CT 249 BG 4	Philadelphia	1
CT 25 BG 3	Philadelphia	3
CT 25 BG 4	Philadelphia	1
CT 252 BG 1	Philadelphia	1
CT 252 BG 2	Philadelphia	1
CT 252 BG 3	Philadelphia	3
CT 252 BG 4	Philadelphia	3
CT 252 BG 5	Philadelphia	1
CT 252 BG 6	Philadelphia	1
CT 252 BG 7	Philadelphia	1
CT 253 BG 1	Philadelphia	1
CT 253 BG 2	Philadelphia	3
CT 253 BG 3	Philadelphia	3
CT 253 BG 4	Philadelphia	3
CT 253 BG 5	Philadelphia	1
CT 254 BG 1	Philadelphia	3
CT 254 BG 2	Philadelphia	3
CT 254 BG 3	Philadelphia	3
CT 254 BG 4	Philadelphia	3

Census Tract & Block Group ID	Place Name	Category
CT 255 BG 1	Philadelphia	3
CT 255 BG 2	Philadelphia	3
CT 255 BG 3	Philadelphia	3
CT 256 BG 1	Philadelphia	3
CT 257 BG 1	Philadelphia	3
CT 258 BG 1	Philadelphia	3
CT 259 BG 1	Philadelphia	3
CT 259 BG 2	Philadelphia	3
CT 259 BG 3	Philadelphia	1
CT 259 BG 4	Philadelphia	3
CT 259 BG 5	Philadelphia	3
CT 259 BG 6	Philadelphia	1
CT 260 BG 1	Philadelphia	3
CT 260 BG 2	Philadelphia	1
CT 260 BG 3	Philadelphia	3
CT 261 BG 1	Philadelphia	3
CT 261 BG 2	Philadelphia	1
CT 261 BG 3	Philadelphia	1
CT 262 BG 1	Philadelphia	3
CT 262 BG 2	Philadelphia	3
CT 262 BG 3	Philadelphia	3
CT 262 BG 4	Philadelphia	3
CT 263.01 BG 1	Philadelphia	3
CT 263.01 BG 2	Philadelphia	3
CT 263.01 BG 3	Philadelphia	3
CT 263.01 BG 4	Philadelphia	3
CT 263.02 BG 1	Philadelphia	3
CT 263.02 BG 2	Philadelphia	1
CT 263.02 BG 3	Philadelphia	3
CT 263.02 BG 4	Philadelphia	3
CT 264 BG 1	Philadelphia	3
CT 264 BG 2	Philadelphia	3
CT 264 BG 3	Philadelphia	1
CT 264 BG 4	Philadelphia	3
CT 264 BG 5	Philadelphia	3
CT 264 BG 6	Philadelphia	3
CT 264 BG 7	Philadelphia	3
CT 265 BG 1	Philadelphia	3
CT 265 BG 2	Philadelphia	1
CT 265 BG 3	Philadelphia	1
CT 265 BG 4	Philadelphia	1
CT 265 BG 5	Philadelphia	3
CT 265 BG 6	Philadelphia	3
CT 266 BG 1	Philadelphia	1
CT 266 BG 2	Philadelphia	1
CT 266 BG 3	Philadelphia	3
CT 266 BG 4	Philadelphia	1
CT 266 BG 5	Philadelphia	1
CT 266 BG 6	Philadelphia	3
CT 266 BG 7	Philadelphia	1
CT 266 BG 8	Philadelphia	3
CT 267 BG 1	Philadelphia	3
CT 267 BG 2	Philadelphia	3
CT 267 BG 3	Philadelphia	3

Census Tract & Block Group ID	Place Name	Category
CT 267 BG 4	Philadelphia	1
CT 267 BG 5	Philadelphia	3
CT 267 BG 6	Philadelphia	3
CT 267 BG 7	Philadelphia	3
CT 268 BG 1	Philadelphia	1
CT 268 BG 2	Philadelphia	1
CT 268 BG 3	Philadelphia	3
CT 268 BG 4	Philadelphia	3
CT 269 BG 1	Philadelphia	3
CT 269 BG 2	Philadelphia	3
CT 27.01 BG 1	Philadelphia	3
CT 27.01 BG 2	Philadelphia	1
CT 27.01 BG 3	Philadelphia	1
CT 27.02 BG 3	Philadelphia	2
CT 270 BG 1	Philadelphia	3
CT 270 BG 2	Philadelphia	3
CT 271 BG 1	Philadelphia	3
CT 271 BG 2	Philadelphia	1
CT 271 BG 3	Philadelphia	3
CT 272 BG 1	Philadelphia	3
CT 272 BG 2	Philadelphia	3
CT 272 BG 3	Philadelphia	1
CT 273 BG 1	Philadelphia	3
CT 273 BG 2	Philadelphia	1
CT 273 BG 3	Philadelphia	1
CT 273 BG 4	Philadelphia	3
CT 273 BG 5	Philadelphia	3
CT 274.01 BG 1	Philadelphia	1
CT 274.01 BG 2	Philadelphia	1
CT 274.01 BG 3	Philadelphia	1
CT 274.02 BG 1	Philadelphia	3
CT 274.02 BG 2	Philadelphia	3
CT 274.02 BG 3	Philadelphia	3
CT 274.02 BG 4	Philadelphia	1
CT 274.02 BG 5	Philadelphia	1
CT 275 BG 1	Philadelphia	3
CT 275 BG 2	Philadelphia	3
CT 275 BG 3	Philadelphia	1
CT 275 BG 4	Philadelphia	1
CT 276 BG 1	Philadelphia	1
CT 276 BG 2	Philadelphia	3
CT 276 BG 3	Philadelphia	1
CT 276 BG 4	Philadelphia	1
CT 277 BG 1	Philadelphia	1
CT 277 BG 2	Philadelphia	1
CT 277 BG 3	Philadelphia	1
CT 277 BG 4	Philadelphia	3
CT 277 BG 5	Philadelphia	3
CT 277 BG 6	Philadelphia	1
CT 278 BG 1	Philadelphia	3
CT 278 BG 2	Philadelphia	1
CT 278 BG 3	Philadelphia	3
CT 278 BG 4	Philadelphia	1
CT 279.01 BG 1	Philadelphia	3

Census Tract & Block Group ID	Place Name	Category
CT 279.01 BG 2	Philadelphia	1
CT 279.01 BG 3	Philadelphia	3
CT 279.01 BG 4	Philadelphia	1
CT 279.02 BG 1	Philadelphia	1
CT 279.02 BG 2	Philadelphia	1
CT 28.01 BG 1	Philadelphia	1
CT 28.01 BG 2	Philadelphia	1
CT 28.01 BG 3	Philadelphia	3
CT 28.02 BG 1	Philadelphia	1
CT 280 BG 1	Philadelphia	1
CT 280 BG 2	Philadelphia	1
CT 280 BG 3	Philadelphia	1
CT 280 BG 4	Philadelphia	1
CT 281 BG 1	Philadelphia	3
CT 281 BG 2	Philadelphia	1
CT 281 BG 3	Philadelphia	1
CT 282 BG 1	Philadelphia	1
CT 282 BG 2	Philadelphia	1
CT 282 BG 3	Philadelphia	1
CT 283 BG 1	Philadelphia	1
CT 283 BG 2	Philadelphia	1
CT 283 BG 3	Philadelphia	3
CT 283 BG 4	Philadelphia	1
CT 283 BG 5	Philadelphia	3
CT 283 BG 6	Philadelphia	1
CT 283 BG 7	Philadelphia	1
CT 284 BG 1	Philadelphia	1
CT 284 BG 2	Philadelphia	1
CT 284 BG 3	Philadelphia	1
CT 284 BG 4	Philadelphia	3
CT 285 BG 1	Philadelphia	1
CT 286 BG 1	Philadelphia	1
CT 286 BG 2	Philadelphia	1
CT 286 BG 3	Philadelphia	1
CT 286 BG 4	Philadelphia	3
CT 286 BG 5	Philadelphia	1
CT 286 BG 6	Philadelphia	1
CT 287 BG 1	Philadelphia	1
CT 287 BG 2	Philadelphia	1
CT 288 BG 1	Philadelphia	1
CT 288 BG 2	Philadelphia	1
CT 288 BG 3	Philadelphia	1
CT 289.01 BG 1	Philadelphia	1
CT 289.01 BG 2	Philadelphia	1
CT 289.01 BG 3	Philadelphia	1
CT 289.02 BG 1	Philadelphia	1
CT 289.02 BG 2	Philadelphia	1
CT 289.02 BG 3	Philadelphia	1
CT 289.02 BG 4	Philadelphia	1
CT 289.02 BG 5	Philadelphia	1
CT 29 BG 1	Philadelphia	2
CT 290 BG 1	Philadelphia	1
CT 290 BG 2	Philadelphia	1
CT 290 BG 3	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 290 BG 4	Philadelphia	1
CT 291 BG 1	Philadelphia	1
CT 291 BG 2	Philadelphia	1
CT 291 BG 3	Philadelphia	1
CT 291 BG 4	Philadelphia	3
CT 292 BG 1	Philadelphia	3
CT 292 BG 2	Philadelphia	1
CT 292 BG 3	Philadelphia	3
CT 293 BG 1	Philadelphia	1
CT 293 BG 2	Philadelphia	1
CT 294 BG 1	Philadelphia	1
CT 294 BG 2	Philadelphia	1
CT 294 BG 3	Philadelphia	1
CT 298 BG 1	Philadelphia	1
CT 298 BG 2	Philadelphia	1
CT 298 BG 3	Philadelphia	3
CT 298 BG 4	Philadelphia	1
CT 298 BG 5	Philadelphia	1
CT 299 BG 1	Philadelphia	1
CT 299 BG 2	Philadelphia	1
CT 299 BG 3	Philadelphia	1
CT 299 BG 4	Philadelphia	1
CT 30.01 BG 1	Philadelphia	1
CT 30.01 BG 3	Philadelphia	3
CT 30.01 BG 4	Philadelphia	1
CT 30.01 BG 5	Philadelphia	1
CT 30.02 BG 1	Philadelphia	3
CT 30.02 BG 2	Philadelphia	1
CT 30.02 BG 3	Philadelphia	3
CT 30.02 BG 4	Philadelphia	1
CT 300 BG 1	Philadelphia	1
CT 300 BG 2	Philadelphia	1
CT 300 BG 3	Philadelphia	1
CT 300 BG 4	Philadelphia	1
CT 300 BG 5	Philadelphia	1
CT 300 BG 6	Philadelphia	1
CT 300 BG 7	Philadelphia	1
CT 301 BG 1	Philadelphia	1
CT 301 BG 2	Philadelphia	1
CT 301 BG 4	Philadelphia	3
CT 301 BG 5	Philadelphia	1
CT 302 BG 1	Philadelphia	1
CT 302 BG 2	Philadelphia	3
CT 302 BG 3	Philadelphia	3
CT 302 BG 4	Philadelphia	3
CT 302 BG 5	Philadelphia	1
CT 305.01 BG 1	Philadelphia	1
CT 305.01 BG 2	Philadelphia	1
CT 305.01 BG 3	Philadelphia	1
CT 305.02 BG 1	Philadelphia	3
CT 305.02 BG 2	Philadelphia	1
CT 305.02 BG 3	Philadelphia	1
CT 305.02 BG 4	Philadelphia	1
CT 305.02 BG 5	Philadelphia	3

Census Tract & Block Group ID	Place Name	Category
CT 306 BG 2	Philadelphia	3
CT 306 BG 3	Philadelphia	3
CT 306 BG 4	Philadelphia	3
CT 306 BG 5	Philadelphia	3
CT 306 BG 6	Philadelphia	3
CT 306 BG 7	Philadelphia	3
CT 307 BG 1	Philadelphia	1
CT 307 BG 2	Philadelphia	1
CT 307 BG 3	Philadelphia	3
CT 308 BG 3	Philadelphia	1
CT 308 BG 4	Philadelphia	3
CT 309 BG 1	Philadelphia	1
CT 309 BG 2	Philadelphia	1
CT 309 BG 3	Philadelphia	1
CT 31 BG 1	Philadelphia	3
CT 31 BG 2	Philadelphia	1
CT 31 BG 3	Philadelphia	1
CT 31 BG 4	Philadelphia	1
CT 31 BG 5	Philadelphia	1
CT 31 BG 6	Philadelphia	3
CT 310 BG 1	Philadelphia	3
CT 310 BG 2	Philadelphia	3
CT 310 BG 4	Philadelphia	3
CT 310 BG 5	Philadelphia	1
CT 310 BG 6	Philadelphia	3
CT 310 BG 7	Philadelphia	3
CT 311.01 BG 1	Philadelphia	1
CT 311.01 BG 2	Philadelphia	1
CT 311.01 BG 3	Philadelphia	3
CT 311.01 BG 4	Philadelphia	1
CT 311.02 BG 1	Philadelphia	3
CT 311.02 BG 2	Philadelphia	1
CT 311.02 BG 3	Philadelphia	1
CT 311.02 BG 4	Philadelphia	1
CT 312 BG 1	Philadelphia	1
CT 312 BG 2	Philadelphia	1
CT 312 BG 3	Philadelphia	1
CT 313 BG 1	Philadelphia	1
CT 313 BG 2	Philadelphia	1
CT 313 BG 3	Philadelphia	3
CT 313 BG 4	Philadelphia	1
CT 313 BG 5	Philadelphia	1
CT 313 BG 6	Philadelphia	1
CT 314.01 BG 1	Philadelphia	1
CT 314.01 BG 2	Philadelphia	1
CT 314.01 BG 3	Philadelphia	1
CT 314.01 BG 4	Philadelphia	1
CT 314.01 BG 5	Philadelphia	1
CT 314.02 BG 1	Philadelphia	1
CT 314.02 BG 2	Philadelphia	1
CT 314.02 BG 3	Philadelphia	1
CT 315.01 BG 3	Philadelphia	2
CT 315.02 BG 1	Philadelphia	1
CT 315.02 BG 2	Philadelphia	2

Census Tract & Block Group ID	Place Name	Category
CT 316 BG 2	Philadelphia	2
CT 316 BG 3	Philadelphia	1
CT 316 BG 5	Philadelphia	2
CT 316 BG 7	Philadelphia	3
CT 317 BG 1	Philadelphia	3
CT 317 BG 2	Philadelphia	3
CT 317 BG 3	Philadelphia	1
CT 317 BG 4	Philadelphia	3
CT 317 BG 5	Philadelphia	1
CT 318 BG 1	Philadelphia	3
CT 318 BG 2	Philadelphia	1
CT 318 BG 3	Philadelphia	1
CT 318 BG 4	Philadelphia	3
CT 319 BG 1	Philadelphia	1
CT 319 BG 2	Philadelphia	3
CT 319 BG 3	Philadelphia	2
CT 319 BG 4	Philadelphia	1
CT 319 BG 5	Philadelphia	3
CT 32 BG 1	Philadelphia	1
CT 32 BG 2	Philadelphia	1
CT 32 BG 3	Philadelphia	1
CT 32 BG 4	Philadelphia	1
CT 32 BG 5	Philadelphia	3
CT 32 BG 6	Philadelphia	1
CT 320 BG 1	Philadelphia	2
CT 320 BG 3	Philadelphia	3
CT 320 BG 4	Philadelphia	1
CT 320 BG 5	Philadelphia	3
CT 320 BG 6	Philadelphia	3
CT 320 BG 7	Philadelphia	2
CT 321 BG 1	Philadelphia	1
CT 321 BG 2	Philadelphia	1
CT 321 BG 3	Philadelphia	2
CT 323 BG 1	Philadelphia	1
CT 323 BG 2	Philadelphia	1
CT 325 BG 1	Philadelphia	3
CT 325 BG 3	Philadelphia	1
CT 325 BG 4	Philadelphia	2
CT 326 BG 1	Philadelphia	1
CT 326 BG 3	Philadelphia	3
CT 326 BG 4	Philadelphia	3
CT 326 BG 5	Philadelphia	3
CT 326 BG 6	Philadelphia	2
CT 329 BG 1	Philadelphia	1
CT 329 BG 3	Philadelphia	1
CT 329 BG 4	Philadelphia	2
CT 33 BG 1	Philadelphia	1
CT 33 BG 2	Philadelphia	1
CT 33 BG 3	Philadelphia	1
CT 33 BG 4	Philadelphia	1
CT 33 BG 5	Philadelphia	2
CT 33 BG 6	Philadelphia	1
CT 330 BG 1	Philadelphia	3
CT 330 BG 3	Philadelphia	2

Census Tract & Block Group ID	Place Name	Category
CT 330 BG 4	Philadelphia	1
CT 330 BG 6	Philadelphia	1
CT 331.02 BG 1	Philadelphia	2
CT 331.02 BG 2	Philadelphia	2
CT 334 BG 3	Philadelphia	1
CT 334 BG 4	Philadelphia	3
CT 335 BG 1	Philadelphia	1
CT 335 BG 2	Philadelphia	1
CT 335 BG 3	Philadelphia	3
CT 336 BG 2	Philadelphia	2
CT 336 BG 3	Philadelphia	2
CT 336 BG 4	Philadelphia	2
CT 337.01 BG 1	Philadelphia	1
CT 337.01 BG 3	Philadelphia	1
CT 337.02 BG 2	Philadelphia	2
CT 338 BG 1	Philadelphia	2
CT 338 BG 3	Philadelphia	2
CT 339 BG 2	Philadelphia	1
CT 340 BG 2	Philadelphia	3
CT 345.01 BG 1	Philadelphia	2
CT 345.02 BG 3	Philadelphia	1
CT 346 BG 1	Philadelphia	1
CT 347.01 BG 1	Philadelphia	3
CT 348.02 BG 1	Philadelphia	3
CT 349 BG 1	Philadelphia	3
CT 349 BG 2	Philadelphia	3
CT 349 BG 4	Philadelphia	2
CT 356.01 BG 4	Philadelphia	2
CT 357.01 BG 1	Philadelphia	2
CT 357.01 BG 2	Philadelphia	3
CT 357.02 BG 1	Philadelphia	2
CT 357.02 BG 2	Philadelphia	2
CT 358 BG 1	Philadelphia	3
CT 358 BG 3	Philadelphia	2
CT 36 BG 1	Philadelphia	3
CT 36 BG 2	Philadelphia	1
CT 36 BG 3	Philadelphia	1
CT 36 BG 4	Philadelphia	1
CT 361 BG 1	Philadelphia	3
CT 364 BG 1	Philadelphia	2
CT 365.01 BG 3	Philadelphia	3
CT 369 BG 3	Philadelphia	2
CT 37.01 BG 1	Philadelphia	1
CT 37.01 BG 2	Philadelphia	1
CT 37.01 BG 3	Philadelphia	1
CT 37.01 BG 4	Philadelphia	1
CT 37.01 BG 5	Philadelphia	3
CT 37.02 BG 1	Philadelphia	1
CT 37.02 BG 2	Philadelphia	1
CT 37.02 BG 3	Philadelphia	1
CT 372 BG 4	Philadelphia	1
CT 373 BG 3	Philadelphia	3
CT 375 BG 1	Philadelphia	3
CT 375 BG 2	Philadelphia	3
CT 376 BG 1	Philadelphia	1
CT 377 BG 1	Philadelphia	1
CT 377 BG 2	Philadelphia	1
CT 377 BG 3	Philadelphia	1
CT 378 BG 2	Philadelphia	2
CT 380 BG 2	Philadelphia	2
CT 381 BG 1	Philadelphia	2
CT 381 BG 2	Philadelphia	1
CT 382 BG 1	Philadelphia	1
CT 382 BG 3	Philadelphia	1
CT 383 BG 1	Philadelphia	1
CT 383 BG 2	Philadelphia	1
CT 383 BG 3	Philadelphia	1
CT 389 BG 1	Philadelphia	1
CT 389 BG 2	Philadelphia	3
CT 389 BG 3	Philadelphia	1
CT 39.01 BG 1	Philadelphia	2
CT 39.01 BG 4	Philadelphia	3
CT 390 BG 1	Philadelphia	1
CT 390 BG 2	Philadelphia	3
CT 390 BG 3	Philadelphia	1
CT 390 BG 4	Philadelphia	1
CT 390 BG 5	Philadelphia	1
CT 390 BG 6	Philadelphia	3
CT 390 BG 7	Philadelphia	1
CT 390 BG 8	Philadelphia	1
CT 40.01 BG 3	Philadelphia	2
CT 41.01 BG 1	Philadelphia	1
CT 41.01 BG 2	Philadelphia	1
CT 41.01 BG 3	Philadelphia	1
CT 41.01 BG 4	Philadelphia	1
CT 41.02 BG 1	Philadelphia	1
CT 41.02 BG 2	Philadelphia	1
CT 41.02 BG 3	Philadelphia	2
CT 41.02 BG 4	Philadelphia	2
CT 42.02 BG 2	Philadelphia	1
CT 5 BG 1	Philadelphia	3
CT 54 BG 1	Philadelphia	3
CT 55 BG 1	Philadelphia	1
CT 55 BG 2	Philadelphia	3
CT 55 BG 3	Philadelphia	3
CT 56 BG 1	Philadelphia	1
CT 60 BG 1	Philadelphia	1
CT 60 BG 2	Philadelphia	1
CT 60 BG 3	Philadelphia	1
CT 60 BG 4	Philadelphia	1
CT 60 BG 5	Philadelphia	3
CT 61 BG 1	Philadelphia	1
CT 61 BG 2	Philadelphia	1
CT 62 BG 1	Philadelphia	3
CT 62 BG 2	Philadelphia	1
CT 62 BG 3	Philadelphia	1
CT 62 BG 4	Philadelphia	1
CT 63 BG 1	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 63 BG 2	Philadelphia	1
CT 63 BG 3	Philadelphia	1
CT 63 BG 4	Philadelphia	1
CT 64 BG 1	Philadelphia	1
CT 64 BG 2	Philadelphia	1
CT 64 BG 3	Philadelphia	1
CT 65 BG 1	Philadelphia	1
CT 65 BG 2	Philadelphia	1
CT 65 BG 3	Philadelphia	1
CT 65 BG 4	Philadelphia	1
CT 65 BG 5	Philadelphia	3
CT 65 BG 6	Philadelphia	1
CT 66 BG 1	Philadelphia	1
CT 66 BG 2	Philadelphia	1
CT 66 BG 3	Philadelphia	1
CT 66 BG 4	Philadelphia	1
CT 67 BG 1	Philadelphia	3
CT 67 BG 2	Philadelphia	3
CT 67 BG 3	Philadelphia	1
CT 67 BG 4	Philadelphia	1
CT 67 BG 5	Philadelphia	1
CT 67 BG 6	Philadelphia	3
CT 67 BG 7	Philadelphia	1
CT 69 BG 1	Philadelphia	1
CT 69 BG 2	Philadelphia	1
CT 69 BG 3	Philadelphia	1
CT 7 BG 3	Philadelphia	3
CT 70 BG 1	Philadelphia	1
CT 70 BG 2	Philadelphia	1
CT 70 BG 3	Philadelphia	1
CT 70 BG 4	Philadelphia	3
CT 70 BG 5	Philadelphia	1
CT 71.01 BG 1	Philadelphia	1
CT 71.01 BG 2	Philadelphia	1
CT 71.01 BG 3	Philadelphia	1
CT 71.02 BG 1	Philadelphia	1
CT 71.02 BG 2	Philadelphia	1
CT 71.02 BG 3	Philadelphia	1
CT 71.02 BG 4	Philadelphia	1
CT 71.02 BG 5	Philadelphia	1
CT 72 BG 1	Philadelphia	1
CT 72 BG 2	Philadelphia	1
CT 72 BG 3	Philadelphia	1
CT 72 BG 4	Philadelphia	1
CT 72 BG 5	Philadelphia	3
CT 72 BG 6	Philadelphia	1
CT 73 BG 1	Philadelphia	1
CT 73 BG 2	Philadelphia	1
CT 73 BG 3	Philadelphia	3
CT 73 BG 4	Philadelphia	1
CT 74 BG 1	Philadelphia	1
CT 74 BG 2	Philadelphia	1
CT 74 BG 3	Philadelphia	1
CT 74 BG 4	Philadelphia	1
CT 74 BG 5	Philadelphia	1
CT 77 BG 1	Philadelphia	1
CT 77 BG 2	Philadelphia	1
CT 78 BG 1	Philadelphia	1
CT 78 BG 2	Philadelphia	1
CT 78 BG 3	Philadelphia	1
CT 79 BG 1	Philadelphia	3
CT 79 BG 3	Philadelphia	3
CT 79 BG 4	Philadelphia	3
CT 80 BG 1	Philadelphia	3
CT 80 BG 2	Philadelphia	3
CT 80 BG 3	Philadelphia	3
CT 80 BG 4	Philadelphia	1
CT 81.01 BG 1	Philadelphia	1
CT 81.01 BG 2	Philadelphia	1
CT 81.01 BG 3	Philadelphia	1
CT 81.02 BG 1	Philadelphia	1
CT 81.02 BG 2	Philadelphia	1
CT 81.02 BG 3	Philadelphia	1
CT 81.02 BG 4	Philadelphia	1
CT 81.02 BG 5	Philadelphia	1
CT 82 BG 1	Philadelphia	1
CT 82 BG 2	Philadelphia	1
CT 82 BG 3	Philadelphia	1
CT 82 BG 4	Philadelphia	3
CT 82 BG 5	Philadelphia	3
CT 82 BG 6	Philadelphia	3
CT 82 BG 7	Philadelphia	1
CT 83.01 BG 1	Philadelphia	1
CT 83.01 BG 2	Philadelphia	3
CT 83.01 BG 3	Philadelphia	1
CT 83.02 BG 1	Philadelphia	1
CT 83.02 BG 2	Philadelphia	1
CT 83.02 BG 3	Philadelphia	1
CT 83.02 BG 4	Philadelphia	3
CT 84 BG 1	Philadelphia	1
CT 84 BG 2	Philadelphia	1
CT 84 BG 3	Philadelphia	3
CT 84 BG 4	Philadelphia	1
CT 84 BG 5	Philadelphia	1
CT 84 BG 6	Philadelphia	3
CT 85 BG 1	Philadelphia	1
CT 85 BG 2	Philadelphia	1
CT 85 BG 3	Philadelphia	3
CT 85 BG 4	Philadelphia	1
CT 85 BG 5	Philadelphia	1
CT 85 BG 6	Philadelphia	1
CT 85 BG 7	Philadelphia	1
CT 86.01 BG 1	Philadelphia	3
CT 86.02 BG 1	Philadelphia	1
CT 86.02 BG 2	Philadelphia	1
CT 86.02 BG 3	Philadelphia	3
CT 87.01 BG 2	Philadelphia	1
CT 87.01 BG 3	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 87.02 BG 1	Philadelphia	1
CT 88.01 BG 1	Philadelphia	2
CT 88.01 BG 2	Philadelphia	1
CT 88.02 BG 1	Philadelphia	1
CT 88.02 BG 2	Philadelphia	1
CT 88.02 BG 3	Philadelphia	2
CT 88.02 BG 4	Philadelphia	2
CT 90 BG 2	Philadelphia	2
CT 90 BG 3	Philadelphia	2
CT 90 BG 4	Philadelphia	2
CT 91 BG 1	Philadelphia	3
CT 91 BG 2	Philadelphia	3
CT 91 BG 3	Philadelphia	1
CT 92 BG 1	Philadelphia	1
CT 92 BG 2	Philadelphia	1
CT 93 BG 1	Philadelphia	1
CT 93 BG 2	Philadelphia	1
CT 93 BG 3	Philadelphia	1
CT 93 BG 4	Philadelphia	1
CT 93 BG 5	Philadelphia	1

Census Tract & Block Group ID	Place Name	Category
CT 94 BG 1	Philadelphia	1
CT 94 BG 2	Philadelphia	1
CT 94 BG 3	Philadelphia	3
CT 94 BG 4	Philadelphia	1
CT 95 BG 1	Philadelphia	1
CT 95 BG 2	Philadelphia	1
CT 95 BG 3	Philadelphia	3
CT 95 BG 4	Philadelphia	1
CT 96 BG 1	Philadelphia	1
CT 96 BG 2	Philadelphia	1
CT 96 BG 3	Philadelphia	1
CT 96 BG 4	Philadelphia	1
CT 96 BG 5	Philadelphia	3
CT 98.01 BG 1	Philadelphia	3
CT 98.01 BG 2	Philadelphia	1
CT 98.02 BG 1	Philadelphia	3
CT 98.02 BG 2	Philadelphia	3
CT 98.02 BG 3	Philadelphia	1
CT 9800 BG 1	Philadelphia	3
CT 9891 BG 1	Philadelphia	1

Table G-EJ19. Census Tracts (CT) and Block Groups (BG) in Delaware County, Pennsylvania (County ID 42-045) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 4003.01 BG 1	Upper Darby	1
CT 4003.01 BG 2	Upper Darby	1
CT 4003.01 BG 3	Upper Darby	1
CT 4003.01 BG 4	Upper Darby	1
CT 4003.02 BG 1	Upper Darby	1
CT 4003.02 BG 2	Upper Darby	1
CT 4003.02 BG 3	Upper Darby	1
CT 4004.01 BG 1	Upper Darby	1
CT 4004.01 BG 2	Upper Darby	1
CT 4004.01 BG 3	Upper Darby	1
CT 4004.02 BG 1	Upper Darby	1
CT 4004.02 BG 2	Upper Darby	1
CT 4004.02 BG 3	Upper Darby	1
CT 4004.02 BG 4	Upper Darby	1
CT 4005 BG 1	Upper Darby	1
CT 4005 BG 2	Upper Darby	3
CT 4005 BG 3	Upper Darby	1
CT 4005 BG 4	Upper Darby	1
CT 4006 BG 1	Upper Darby	1
CT 4006 BG 2	Upper Darby	2
CT 4006 BG 3	Upper Darby	3
CT 4006 BG 4	Upper Darby	3
CT 4006 BG 5	Upper Darby	1

Census Tract & Block Group ID	Place Name	Category
CT 4007 BG 1	Upper Darby	1
CT 4007 BG 2	Upper Darby	1
CT 4007 BG 3	Upper Darby	3
CT 4007 BG 4	Upper Darby	1
CT 4008.01 BG 1	Upper Darby	1
CT 4008.02 BG 1	Upper Darby	1
CT 4008.02 BG 3	Upper Darby	3
CT 4010 BG 2	Upper Darby	3
CT 4011.01 BG 1	Upper Darby	3
CT 4011.01 BG 3	Upper Darby	2
CT 4011.03 BG 2	Upper Darby	3
CT 4011.04 BG 1	Upper Darby	2
CT 4012 BG 2	Upper Darby	2
CT 4012 BG 3	Upper Darby	2
CT 4012 BG 4	Upper Darby	2
CT 4013.01 BG 1	Upper Darby	3
CT 4013.02 BG 1	Upper Darby	2
CT 4014.01 BG 1	Upper Darby	2
CT 4014.01 BG 2	Upper Darby	2
CT 4014.02 BG 2	Upper Darby	3
CT 4014.02 BG 3	Upper Darby	2
CT 4014.02 BG 4	Upper Darby	1
CT 4015.01 BG 2	Upper Darby	2

Census Tract & Block Group ID	Place Name	Category
CT 4015.02 BG 1	Upper Darby	1
CT 4015.02 BG 3	Upper Darby	1
CT 4016 BG 1	Upper Darby	1
CT 4016 BG 2	Upper Darby	1
CT 4017 BG 1	East Lansdowne	1
CT 4018 BG 1	Lansdowne	3
CT 4018 BG 2	Lansdowne	1
CT 4018 BG 3	Lansdowne	1
CT 4019 BG 1	Lansdowne	1
CT 4019 BG 3	Lansdowne	1
CT 4019 BG 4	Lansdowne	3
CT 4019 BG 5	Lansdowne	1
CT 4020 BG 1	Lansdowne	1
CT 4020 BG 2	Lansdowne	3
CT 4021 BG 1	Yeadon	1
CT 4021 BG 2	Yeadon	1
CT 4021 BG 3	Yeadon	3
CT 4021 BG 4	Yeadon	1
CT 4022 BG 1	Yeadon	1
CT 4022 BG 2	Yeadon	1
CT 4023 BG 1	Yeadon	1
CT 4023 BG 2	Yeadon	1
CT 4023 BG 3	Yeadon	1
CT 4024 BG 1	Darby	1
CT 4024 BG 2	Darby	1
CT 4024 BG 3	Darby	1
CT 4025 BG 1	Darby	1
CT 4025 BG 2	Darby	1
CT 4025 BG 3	Darby	1
CT 4026 BG 1	Darby	1
CT 4026 BG 2	Darby	1
CT 4027 BG 1	Colwyn	1
CT 4027 BG 2	Colwyn	1
CT 4028 BG 1	Sharon Hill	1
CT 4028 BG 2	Sharon Hill	1
CT 4028 BG 3	Sharon Hill	3
CT 4028 BG 4	Sharon Hill	3
CT 4028 BG 5	Sharon Hill	1
CT 4029 BG 1	Darby	1
CT 4029 BG 2	Darby	1
CT 4029 BG 3	Darby	1
CT 4030.01 BG 2	Darby	2
CT 4030.02 BG 1	Darby	2
CT 4030.02 BG 2	Darby	2
CT 4031.01 BG 1	Collingdale	1
CT 4031.01 BG 2	Collingdale	1
CT 4031.01 BG 3	Collingdale	1
CT 4031.03 BG 1	Collingdale	1
CT 4031.03 BG 2	Collingdale	3
CT 4031.04 BG 1	Collingdale	1
CT 4031.04 BG 2	Collingdale	1
CT 4032 BG 1	Aldan	3
CT 4032 BG 4	Aldan	1
CT 4033 BG 1	Clifton Heights	2
CT 4033 BG 2	Clifton Heights	1
CT 4033 BG 3	Clifton Heights	1
CT 4033 BG 4	Clifton Heights	2
CT 4033 BG 5	Clifton Heights	3
CT 4034.01 BG 2	Folcroft	1
CT 4034.02 BG 1	Folcroft	1
CT 4034.02 BG 2	Folcroft	1
CT 4035.01 BG 3	Glenolden	2
CT 4035.02 BG 1	Glenolden	2
CT 4035.02 BG 2	Glenolden	1
CT 4036.01 BG 3	Norwood	2
CT 4036.01 BG 4	Norwood	2
CT 4037.01 BG 1	Tinicum	2
CT 4037.02 BG 1	Tinicum	2
CT 4037.02 BG 2	Tinicum	2
CT 4038 BG 3	Prospect Park	3
CT 4038 BG 5	Prospect Park	2
CT 4039.01 BG 2	Ridley Park	2
CT 4040.04 BG 3	Ridley	2
CT 4041.01 BG 4	Ridley	2
CT 4041.02 BG 3	Ridley	2
CT 4041.02 BG 4	Ridley	1
CT 4041.03 BG 1	Ridley	2
CT 4041.03 BG 2	Ridley	2
CT 4043 BG 1	Eddystone	2
CT 4043 BG 2	Eddystone	1
CT 4043 BG 3	Eddystone	2
CT 4044 BG 1	Chester	3
CT 4044 BG 2	Chester	1
CT 4045 BG 1	Chester	1
CT 4045 BG 2	Chester	1
CT 4045 BG 3	Chester	1
CT 4045 BG 4	Chester	1
CT 4046 BG 1	Chester	1
CT 4046 BG 2	Chester	1
CT 4046 BG 3	Chester	3
CT 4047 BG 1	Chester	1
CT 4047 BG 2	Chester	1
CT 4048 BG 1	Chester	1
CT 4048 BG 2	Chester	1
CT 4048 BG 3	Chester	1
CT 4049 BG 1	Chester	1
CT 4049 BG 2	Chester	1
CT 4050 BG 1	Chester	1
CT 4050 BG 2	Chester	1
CT 4050 BG 3	Chester	1
CT 4051 BG 1	Chester	1
CT 4051 BG 2	Chester	1
CT 4052 BG 1	Chester	1
CT 4052 BG 2	Chester	1
CT 4052 BG 3	Chester	1
CT 4053 BG 1	Chester	1
CT 4053 BG 2	Chester	1
CT 4054 BG 1	Chester	1

Census Tract & Block Group ID	Place Name	Category
CT 4054 BG 2	Chester	1
CT 4061 BG 1	Parkside	2
CT 4061 BG 2	Parkside	2
CT 4062.02 BG 4	Brookhaven	2
CT 4063 BG 1	Upland	1
CT 4063 BG 2	Upland	1
CT 4063 BG 3	Upland	1
CT 4064.01 BG 1	Chester	1
CT 4064.01 BG 2	Chester	1
CT 4064.02 BG 1	Chester	1
CT 4064.02 BG 2	Chester	1
CT 4065 BG 1	Trainer	1
CT 4065 BG 2	Trainer	1
CT 4066 BG 1	Marcus Hook	2
CT 4066 BG 2	Marcus Hook	1
CT 4067 BG 1	Lower Chichester	2
CT 4067 BG 2	Lower Chichester	2
CT 4068.01 BG 1	Upper Chichester	2
CT 4068.01 BG 3	Upper Chichester	2
CT 4068.02 BG 2	Upper Chichester	1
CT 4068.02 BG 3	Upper Chichester	2
CT 4068.02 BG 4	Upper Chichester	2
CT 4068.03 BG 4	Upper Chichester	2
CT 4069.03 BG 2	Aston	2
CT 4074.01 BG 4	Nether Providence	3
CT 4075.01 BG 1	Media	2

Census Tract & Block Group ID	Place Name	Category
CT 4077 BG 2	Springfield	1
CT 4078.06 BG 1	Springfield	3
CT 4079.03 BG 1	Upper Providence	3
CT 4085 BG 1	Haverford	3
CT 4088 BG 1	Haverford	2
CT 4088 BG 5	Haverford	2
CT 4096.02 BG 1	Radnor	1
CT 4096.02 BG 3	Radnor	2
CT 4098.02 BG 2	Radnor	2
CT 4098.03 BG 2	Radnor	2
CT 4098.03 BG 5	Radnor	2
CT 4099.02 BG 1	Newtown	2
CT 4101 BG 3	Thornbury	2
CT 4103.01 BG 2	Concord	3
CT 4105 BG 1	Millbourne	1
CT 4105 BG 2	Upper Darby	1
CT 4105 BG 3	Upper Darby	1
CT 4105 BG 4	Upper Darby	1
CT 4105 BG 5	Upper Darby	1
CT 4107 BG 1	Chester	1
CT 4107 BG 2	Chester	1
CT 4107 BG 3	Chester	1
CT 4107 BG 4	Chester	1
CT 4107 BG 5	Chester	1
CT 4108 BG 2	Nether Providence	2
CT 4108 BG 7	Nether Providence	3

Table G-EJ20. Census Tracts (CT) and Block Groups (BG) in Baltimore County, Maryland (County ID 24-005) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 4001 BG 1	Catonsville	3
CT 4001 BG 3	Catonsville	2
CT 4002 BG 1	Catonsville	2
CT 4004 BG 2	Catonsville	2
CT 4006 BG 2	Catonsville	1
CT 4006 BG 3	Catonsville	2
CT 4007.01 BG 2	Catonsville	3
CT 4008 BG 1	Catonsville	1
CT 4008 BG 2	Catonsville	2
CT 4009 BG 1	Catonsville	3
CT 4010 BG 1	Catonsville	2
CT 4011.01 BG 1	Woodlawn	1
CT 4011.01 BG 2	Woodlawn	3
CT 4011.01 BG 3	Woodlawn	1
CT 4011.01 BG 4	Woodlawn	1
CT 4011.02 BG 1	Woodlawn	1
CT 4012 BG 1	Woodlawn	3
CT 4012 BG 2	Woodlawn	3

Census Tract & Block Group ID	Place Name	Category
CT 4013.01 BG 1	Woodlawn	1
CT 4013.01 BG 2	Woodlawn	3
CT 4013.01 BG 3	Woodlawn	1
CT 4013.02 BG 1	Woodlawn	1
CT 4013.02 BG 2	Woodlawn	3
CT 4015.04 BG 1	Woodlawn	3
CT 4015.04 BG 2	Woodlawn	3
CT 4015.04 BG 3	Woodlawn	1
CT 4015.05 BG 1	Woodlawn	1
CT 4015.05 BG 2	Woodlawn	1
CT 4015.05 BG 3	Woodlawn	1
CT 4015.06 BG 1	Woodlawn	3
CT 4015.06 BG 2	Woodlawn	3
CT 4015.06 BG 3	Woodlawn	3
CT 4015.07 BG 1	Woodlawn	1
CT 4015.07 BG 2	Woodlawn	1
CT 4015.07 BG 3	Woodlawn	1
CT 4015.07 BG 4	Woodlawn	1

Census Tract & Block Group ID	Place Name	Category
CT 4022.01 BG 1	Un-named Area	3
CT 4022.01 BG 2	Un-named Area	1
CT 4023.02 BG 1	Milford Mill	3
CT 4023.02 BG 2	Milford Mill	1
CT 4023.03 BG 1	Milford Mill	1
CT 4023.03 BG 2	Milford Mill	3
CT 4023.03 BG 3	Milford Mill	3
CT 4023.03 BG 4	Milford Mill	1
CT 4023.03 BG 5	Milford Mill	3
CT 4023.04 BG 1	Lochearn	1
CT 4023.04 BG 2	Lochearn	3
CT 4023.04 BG 3	Lochearn	1
CT 4023.05 BG 1	Lochearn	1
CT 4023.05 BG 2	Lochearn	1
CT 4023.06 BG 1	Milford Mill	1
CT 4023.06 BG 2	Milford Mill	1
CT 4023.07 BG 1	Milford Mill	1
CT 4023.07 BG 2	Milford Mill	3
CT 4023.07 BG 3	Milford Mill	1
CT 4024.03 BG 1	Lochearn	1
CT 4024.03 BG 2	Lochearn	3
CT 4024.04 BG 1	Lochearn	1
CT 4024.04 BG 2	Lochearn	3
CT 4024.04 BG 3	Lochearn	1
CT 4024.05 BG 1	Woodlawn	3
CT 4024.05 BG 2	Lochearn	1
CT 4024.06 BG 1	Milford Mill	3
CT 4024.06 BG 2	Milford Mill	1
CT 4024.06 BG 3	Milford Mill	1
CT 4024.07 BG 1	Milford Mill	3
CT 4024.07 BG 2	Milford Mill	1
CT 4025.03 BG 1	Randallstown	1
CT 4025.03 BG 2	Randallstown	3
CT 4025.03 BG 3	Randallstown	1
CT 4025.04 BG 1	Randallstown	3
CT 4025.04 BG 2	Randallstown	3
CT 4025.05 BG 1	Randallstown	3
CT 4025.05 BG 2	Randallstown	1
CT 4025.06 BG 1	Randallstown	3
CT 4025.06 BG 2	Randallstown	3
CT 4025.09 BG 1	Owings Mills	3
CT 4025.09 BG 2	Owings Mills	1
CT 4025.09 BG 3	Owings Mills	3
CT 4026.02 BG 1	Randallstown	1
CT 4026.02 BG 2	Randallstown	1
CT 4026.03 BG 1	Randallstown	3
CT 4026.03 BG 2	Owings Mills	3
CT 4026.03 BG 3	Randallstown	3
CT 4026.04 BG 1	Randallstown	3
CT 4026.04 BG 2	Randallstown	3
CT 4026.04 BG 3	Randallstown	1
CT 4031 BG 1	Lochearn	3
CT 4031 BG 2	Lochearn	3
CT 4032.01 BG 1	Lochearn	1
CT 4032.01 BG 2	Lochearn	1
CT 4032.02 BG 1	Lochearn	3
CT 4033 BG 1	Lochearn	3

Census Tract & Block Group ID	Place Name	Category
CT 4033 BG 2	Lochearn	3
CT 4034.02 BG 1	Pikesville	1
CT 4034.02 BG 2	Pikesville	3
CT 4034.02 BG 3	Pikesville	1
CT 4034.02 BG 4	Pikesville	1
CT 4036.02 BG 1	Towson	1
CT 4037.01 BG 3	Garrison	1
CT 4037.01 BG 5	Garrison	3
CT 4037.02 BG 2	Garrison	3
CT 4041.01 BG 2	Owings Mills	3
CT 4041.02 BG 1	Owings Mills	3
CT 4041.02 BG 2	Owings Mills	1
CT 4042.01 BG 1	Reisterstown	3
CT 4042.01 BG 2	Reisterstown	1
CT 4042.01 BG 3	Reisterstown	3
CT 4042.02 BG 1	Owings Mills	1
CT 4042.02 BG 2	Owings Mills	1
CT 4042.02 BG 3	Owings Mills	1
CT 4042.02 BG 4	Owings Mills	1
CT 4044.02 BG 2	Un-named Area	1
CT 4044.03 BG 1	Reisterstown	3
CT 4044.03 BG 2	Reisterstown	1
CT 4044.04 BG 1	Reisterstown	1
CT 4045.01 BG 1	Reisterstown	2
CT 4045.01 BG 4	Reisterstown	3
CT 4045.02 BG 1	Reisterstown	1
CT 4045.02 BG 3	Reisterstown	1
CT 4046 BG 2	Un-named Area	2
CT 4083.04 BG 2	Un-named Area	1
CT 4085.03 BG 2	Cockeysville	1
CT 4085.06 BG 1	Cockeysville	1
CT 4085.06 BG 2	Cockeysville	1
CT 4085.07 BG 1	Cockeysville	3
CT 4085.07 BG 2	Cockeysville	1
CT 4085.07 BG 3	Cockeysville	3
CT 4113.03 BG 1	Perry Hall	1
CT 4113.06 BG 1	Perry Hall	1
CT 4113.06 BG 3	Perry Hall	3
CT 4113.07 BG 2	White Marsh	3
CT 4113.09 BG 3	Un-named Area	3
CT 4114.07 BG 4	Carney	1
CT 4114.08 BG 1	Carney	1
CT 4114.08 BG 2	Perry Hall	1
CT 4114.1 BG 3	Perry Hall	3
CT 4201 BG 1	Dundalk	2
CT 4203.01 BG 1	Dundalk	2
CT 4203.02 BG 1	Dundalk	2
CT 4203.02 BG 2	Dundalk	2
CT 4203.03 BG 1	Dundalk	2
CT 4204.01 BG 1	Dundalk	2
CT 4204.01 BG 2	Dundalk	1
CT 4204.01 BG 3	Dundalk	2
CT 4204.02 BG 1	Dundalk	2
CT 4205 BG 1	Dundalk	2
CT 4205 BG 2	Dundalk	1
CT 4206 BG 1	Dundalk	2
CT 4206 BG 2	Dundalk	2

Census Tract & Block Group ID	Place Name	Category
CT 4206 BG 3	Dundalk	2
CT 4207.01 BG 1	Dundalk	2
CT 4207.02 BG 1	Dundalk	2
CT 4208 BG 1	Dundalk	2
CT 4208 BG 3	Dundalk	2
CT 4209 BG 1	Dundalk	2
CT 4209 BG 2	Dundalk	2
CT 4209 BG 3	Dundalk	2
CT 4210 BG 1	Dundalk	2
CT 4211.01 BG 1	Dundalk	2
CT 4211.01 BG 2	Dundalk	2
CT 4211.02 BG 2	Dundalk	2
CT 4212 BG 1	Dundalk	2
CT 4212 BG 2	Dundalk	2
CT 4213 BG 1	Dundalk	1
CT 4213 BG 2	Dundalk	1
CT 4213 BG 3	Dundalk	1
CT 4301.01 BG 1	Baltimore Highlands	1
CT 4301.01 BG 2	Baltimore Highlands	1
CT 4301.04 BG 2	Baltimore Highlands	2
CT 4302 BG 1	Lansdowne	2
CT 4302 BG 3	Lansdowne	2
CT 4303 BG 1	Lansdowne	2
CT 4303 BG 2	Lansdowne	1
CT 4303 BG 3	Lansdowne	2
CT 4303 BG 4	Lansdowne	1
CT 4304 BG 3	Arbutus	2
CT 4308 BG 1	Arbutus	2
CT 4308 BG 2	Arbutus	2
CT 4309 BG 1	Arbutus	1
CT 4309 BG 2	Arbutus	1
CT 4309 BG 3	Arbutus	1
CT 4401 BG 1	Parkville	2
CT 4402 BG 1	Overlea	1
CT 4403 BG 1	Overlea	1
CT 4404 BG 1	Overlea	1
CT 4404 BG 2	Overlea	2
CT 4404 BG 3	Overlea	3
CT 4404 BG 4	Overlea	2
CT 4405 BG 2	Overlea	2
CT 4407.01 BG 1	Rossville	1
CT 4407.01 BG 2	Rossville	1
CT 4407.01 BG 3	Rossville	1
CT 4407.02 BG 1	Rossville	1
CT 4408 BG 1	Rossville	3
CT 4409 BG 1	Rosedale	1
CT 4409 BG 2	Rosedale	1
CT 4410 BG 1	Rosedale	3
CT 4410 BG 2	Rosedale	1
CT 4411.01 BG 2	Rosedale	2
CT 4411.02 BG 1	Rosedale	1
CT 4411.02 BG 4	Rosedale	2
CT 4501 BG 3	Rosedale	2
CT 4502 BG 2	Essex	2
CT 4503 BG 1	Essex	2
CT 4503 BG 2	Essex	2
CT 4504 BG 2	Essex	2

Census Tract & Block Group ID	Place Name	Category
CT 4505.01 BG 1	Essex	2
CT 4505.01 BG 2	Essex	2
CT 4505.01 BG 3	Essex	2
CT 4505.03 BG 1	Essex	1
CT 4505.03 BG 2	Essex	1
CT 4505.03 BG 3	Essex	1
CT 4505.04 BG 1	Essex	2
CT 4505.04 BG 2	Essex	1
CT 4505.04 BG 3	Essex	1
CT 4508 BG 1	Essex	2
CT 4508 BG 2	Essex	1
CT 4508 BG 3	Essex	1
CT 4509 BG 1	Essex	2
CT 4509 BG 2	Essex	2
CT 4511 BG 1	Essex	1
CT 4512 BG 2	Middle River	2
CT 4513 BG 1	Middle River	1
CT 4513 BG 2	Middle River	2
CT 4514.01 BG 1	Middle River	1
CT 4514.01 BG 2	Middle River	1
CT 4514.02 BG 2	Middle River	1
CT 4514.02 BG 3	Middle River	1
CT 4515 BG 1	Middle River	2
CT 4515 BG 2	Middle River	1
CT 4515 BG 3	Middle River	2
CT 4516 BG 1	Middle River	2
CT 4518.01 BG 1	Un-named Area	2
CT 4518.01 BG 4	Un-named Area	1
CT 4518.02 BG 3	Middle River	2
CT 4521 BG 2	Edgemere	2
CT 4521 BG 3	Edgemere	2
CT 4523 BG 1	Dundalk	1
CT 4523 BG 2	Dundalk	2
CT 4524 BG 1	Dundalk	2
CT 4524 BG 2	Dundalk	2
CT 4525 BG 2	Dundalk	2
CT 4903.01 BG 1	Towson	1
CT 4903.01 BG 2	Towson	2
CT 4903.02 BG 1	Towson	3
CT 4906.05 BG 1	Towson	2
CT 4906.05 BG 2	Towson	3
CT 4908 BG 2	Towson	2
CT 4909 BG 1	Towson	2
CT 4909 BG 2	Towson	2
CT 4909 BG 3	Towson	2
CT 4911 BG 1	Towson	3
CT 4911 BG 2	Towson	1
CT 4912.02 BG 1	Towson	2
CT 4913 BG 2	Towson	1
CT 4914.01 BG 1	Parkville	1
CT 4914.01 BG 2	Parkville	1
CT 4914.01 BG 3	Parkville	1
CT 4914.02 BG 1	Parkville	3
CT 4914.02 BG 2	Parkville	1
CT 4915 BG 1	Parkville	2
CT 4915 BG 3	Parkville	1
CT 4916 BG 1	Parkville	2

Census Tract & Block Group ID	Place Name	Category
CT 4916 BG 2	Parkville	2
CT 4916 BG 3	Parkville	3
CT 4917.01 BG 2	Carney	1
CT 4919 BG 1	Carney	2
CT 4920.01 BG 1	Parkville	3
CT 4920.02 BG 3	Parkville	1
CT 4921.01 BG 1	Parkville	2
CT 4922 BG 2	Carney	2
CT 4923 BG 1	Essex	2
CT 4923 BG 2	Essex	2
CT 4924.01 BG 1	Randallstown	3
CT 4924.01 BG 2	Owings Mills	3
CT 4924.02 BG 1	Owings Mills	3
CT 4924.02 BG 2	Owings Mills	3
CT 4925 BG 2	Catonsville	1
CT 4926 BG 1	Carney	3
CT 4926 BG 2	Carney	2
CT 4926 BG 3	Carney	1

Table G-EJ21. Census Tracts (CT) and Block Groups (BG) in the City of Baltimore, Maryland (County ID 24-510) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.
Note that Baltimore is an independent city in Maryland and is considered the equivalent of a county.

Census Tract & Block Group ID	Place Name	Category
CT 1001 BG 1	Baltimore	1
CT 1001 BG 2	Baltimore	1
CT 1001 BG 3	Baltimore	3
CT 1001 BG 4	Baltimore	1
CT 1002 BG 1	Baltimore	1
CT 1002 BG 2	Baltimore	1
CT 1002 BG 3	Baltimore	1
CT 1003 BG 1	Baltimore	3
CT 1101 BG 2	Baltimore	3
CT 1102 BG 2	Baltimore	2
CT 1201 BG 4	Baltimore	1
CT 1202.02 BG 2	Baltimore	1
CT 1202.02 BG 3	Baltimore	1
CT 1202.02 BG 4	Baltimore	2
CT 1202.02 BG 5	Baltimore	3
CT 1203 BG 1	Baltimore	3
CT 1203 BG 2	Baltimore	3
CT 1203 BG 3	Baltimore	1
CT 1203 BG 4	Baltimore	1
CT 1204 BG 1	Baltimore	1
CT 1204 BG 2	Baltimore	1
CT 1205 BG 1	Baltimore	3
CT 1205 BG 2	Baltimore	1
CT 1206 BG 1	Baltimore	3
CT 1206 BG 2	Baltimore	1
CT 1206 BG 3	Baltimore	1
CT 1207 BG 2	Baltimore	2
CT 1301 BG 1	Baltimore	3
CT 1301 BG 2	Baltimore	1
CT 1301 BG 3	Baltimore	3
CT 1301 BG 4	Baltimore	1
CT 1302 BG 1	Baltimore	3
CT 1302 BG 2	Baltimore	3
CT 1302 BG 3	Baltimore	1
CT 1302 BG 4	Baltimore	1
CT 1303 BG 1	Baltimore	3
CT 1303 BG 2	Baltimore	1
CT 1303 BG 3	Baltimore	1
CT 1304 BG 1	Baltimore	1
CT 1304 BG 2	Baltimore	1
CT 1304 BG 3	Baltimore	1
CT 1307 BG 1	Baltimore	2
CT 1308.03 BG 1	Baltimore	2
CT 1308.05 BG 1	Baltimore	3
CT 1401 BG 2	Baltimore	3
CT 1401 BG 3	Baltimore	1
CT 1402 BG 1	Baltimore	1
CT 1402 BG 2	Baltimore	3
CT 1402 BG 3	Baltimore	1
CT 1402 BG 4	Baltimore	1
CT 1403 BG 1	Baltimore	1
CT 1403 BG 2	Baltimore	1
CT 1403 BG 3	Baltimore	3
CT 1403 BG 4	Baltimore	3
CT 1501 BG 1	Baltimore	1
CT 1501 BG 2	Baltimore	1
CT 1501 BG 3	Baltimore	1
CT 1502 BG 1	Baltimore	3
CT 1502 BG 2	Baltimore	1
CT 1502 BG 3	Baltimore	1
CT 1503 BG 1	Baltimore	1
CT 1503 BG 2	Baltimore	3
CT 1503 BG 3	Baltimore	1
CT 1504 BG 1	Baltimore	1
CT 1504 BG 2	Baltimore	1
CT 1504 BG 3	Baltimore	1
CT 1505 BG 1	Baltimore	1
CT 1505 BG 2	Baltimore	1

Census Tract & Block Group ID	Place Name	Category
CT 1506 BG 1	Baltimore	1
CT 1506 BG 2	Baltimore	1
CT 1506 BG 3	Baltimore	1
CT 1506 BG 4	Baltimore	1
CT 1506 BG 5	Baltimore	1
CT 1507.01 BG 1	Baltimore	1
CT 1507.01 BG 2	Baltimore	3
CT 1507.01 BG 3	Baltimore	1
CT 1507.02 BG 1	Baltimore	3
CT 1507.02 BG 2	Baltimore	3
CT 1507.02 BG 3	Baltimore	1
CT 1508 BG 1	Baltimore	1
CT 1508 BG 2	Baltimore	1
CT 1508 BG 3	Baltimore	1
CT 1508 BG 4	Baltimore	3
CT 1508 BG 5	Baltimore	1
CT 1508 BG 6	Baltimore	3
CT 1509 BG 1	Baltimore	1
CT 1509 BG 2	Baltimore	3
CT 1509 BG 3	Baltimore	3
CT 1509 BG 4	Baltimore	3
CT 1510 BG 1	Baltimore	1
CT 1510 BG 2	Baltimore	1
CT 1510 BG 3	Baltimore	1
CT 1510 BG 4	Baltimore	3
CT 1510 BG 5	Baltimore	3
CT 1510 BG 6	Baltimore	1
CT 1510 BG 7	Baltimore	1
CT 1511 BG 1	Baltimore	3
CT 1511 BG 2	Baltimore	1
CT 1511 BG 3	Baltimore	3
CT 1511 BG 4	Baltimore	3
CT 1511 BG 5	Baltimore	1
CT 1511 BG 6	Baltimore	3
CT 1512 BG 1	Baltimore	1
CT 1512 BG 2	Baltimore	1
CT 1512 BG 3	Baltimore	1
CT 1512 BG 4	Baltimore	1
CT 1512 BG 5	Baltimore	1
CT 1513 BG 1	Baltimore	1
CT 1513 BG 2	Baltimore	1
CT 1513 BG 3	Baltimore	1
CT 1513 BG 4	Baltimore	1
CT 1513 BG 5	Baltimore	1
CT 1601 BG 1	Baltimore	1
CT 1601 BG 2	Baltimore	1
CT 1601 BG 3	Baltimore	1
CT 1601 BG 4	Baltimore	1
CT 1602 BG 1	Baltimore	3
CT 1602 BG 2	Baltimore	1
CT 1602 BG 3	Baltimore	1
CT 1603 BG 1	Baltimore	1
CT 1603 BG 2	Baltimore	1
CT 1604 BG 1	Baltimore	1

Census Tract & Block Group ID	Place Name	Category
CT 1604 BG 2	Baltimore	1
CT 1604 BG 3	Baltimore	1
CT 1604 BG 4	Baltimore	1
CT 1605 BG 1	Baltimore	1
CT 1605 BG 2	Baltimore	1
CT 1605 BG 3	Baltimore	1
CT 1605 BG 4	Baltimore	1
CT 1605 BG 5	Baltimore	3
CT 1606 BG 1	Baltimore	1
CT 1606 BG 2	Baltimore	1
CT 1606 BG 3	Baltimore	1
CT 1606 BG 4	Baltimore	1
CT 1606 BG 5	Baltimore	3
CT 1607 BG 1	Baltimore	1
CT 1607 BG 2	Baltimore	1
CT 1607 BG 3	Baltimore	1
CT 1607 BG 4	Baltimore	1
CT 1607 BG 5	Baltimore	3
CT 1607 BG 6	Baltimore	1
CT 1607 BG 7	Baltimore	1
CT 1608.01 BG 1	Baltimore	3
CT 1608.01 BG 2	Baltimore	1
CT 1608.01 BG 3	Baltimore	3
CT 1608.01 BG 4	Baltimore	3
CT 1608.02 BG 1	Baltimore	1
CT 1608.02 BG 2	Baltimore	1
CT 1608.02 BG 3	Baltimore	1
CT 1701 BG 1	Baltimore	1
CT 1701 BG 2	Baltimore	1
CT 1702 BG 1	Baltimore	1
CT 1702 BG 2	Baltimore	1
CT 1702 BG 3	Baltimore	1
CT 1703 BG 1	Baltimore	1
CT 1703 BG 2	Baltimore	1
CT 1801 BG 1	Baltimore	1
CT 1801 BG 2	Baltimore	1
CT 1802 BG 1	Baltimore	1
CT 1802 BG 2	Baltimore	1
CT 1803 BG 1	Baltimore	3
CT 1803 BG 2	Baltimore	1
CT 1901 BG 1	Baltimore	1
CT 1901 BG 2	Baltimore	1
CT 1901 BG 3	Baltimore	1
CT 1902 BG 1	Baltimore	3
CT 1902 BG 2	Baltimore	1
CT 1903 BG 1	Baltimore	1
CT 1903 BG 2	Baltimore	1
CT 1903 BG 3	Baltimore	1
CT 1903 BG 4	Baltimore	1
CT 2001 BG 1	Baltimore	1
CT 2001 BG 2	Baltimore	1
CT 2002 BG 1	Baltimore	1
CT 2002 BG 2	Baltimore	1
CT 2002 BG 3	Baltimore	1

Census Tract & Block Group ID	Place Name	Category
CT 2002 BG 4	Baltimore	1
CT 2002 BG 5	Baltimore	1
CT 2003 BG 1	Baltimore	1
CT 2003 BG 2	Baltimore	1
CT 2004 BG 1	Baltimore	1
CT 2004 BG 2	Baltimore	1
CT 2005 BG 1	Baltimore	1
CT 2005 BG 2	Baltimore	3
CT 2005 BG 3	Baltimore	1
CT 2005 BG 4	Baltimore	1
CT 2005 BG 5	Baltimore	1
CT 2006 BG 1	Baltimore	2
CT 2006 BG 2	Baltimore	1
CT 2006 BG 3	Baltimore	1
CT 2007.01 BG 1	Baltimore	1
CT 2007.01 BG 2	Baltimore	1
CT 2007.01 BG 3	Baltimore	1
CT 2007.01 BG 4	Baltimore	3
CT 2007.01 BG 5	Baltimore	1
CT 2007.02 BG 1	Baltimore	1
CT 2007.02 BG 2	Baltimore	1
CT 2008 BG 1	Baltimore	1
CT 2008 BG 2	Baltimore	1
CT 2008 BG 3	Baltimore	1
CT 2101 BG 1	Baltimore	1
CT 2101 BG 2	Baltimore	1
CT 2102 BG 1	Baltimore	1
CT 2102 BG 2	Baltimore	1
CT 2301 BG 2	Baltimore	1
CT 2501.01 BG 1	Baltimore	1
CT 2501.01 BG 2	Baltimore	3
CT 2501.02 BG 1	Baltimore	1
CT 2501.02 BG 2	Baltimore	1
CT 2501.03 BG 1	Baltimore	1
CT 2501.03 BG 4	Baltimore	3
CT 2502.03 BG 1	Baltimore	1
CT 2502.03 BG 2	Baltimore	1
CT 2502.04 BG 1	Baltimore	1
CT 2502.04 BG 2	Baltimore	1
CT 2502.05 BG 1	Baltimore	2
CT 2502.05 BG 2	Baltimore	1
CT 2502.05 BG 4	Baltimore	1
CT 2502.05 BG 5	Baltimore	3
CT 2502.06 BG 1	Baltimore	2
CT 2502.07 BG 1	Baltimore	1
CT 2502.07 BG 2	Baltimore	1
CT 2503.01 BG 1	Baltimore	3
CT 2503.01 BG 2	Baltimore	1
CT 2503.03 BG 1	Baltimore	2
CT 2503.03 BG 2	Baltimore	1
CT 2503.03 BG 3	Baltimore	2
CT 2504.01 BG 1	Baltimore	2
CT 2504.01 BG 3	Baltimore	1
CT 2504.02 BG 1	Baltimore	3
CT 2504.02 BG 2	Baltimore	1
CT 2504.02 BG 3	Baltimore	3
CT 2504.02 BG 4	Baltimore	1
CT 2505 BG 2	Baltimore	1
CT 2505 BG 3	Baltimore	2
CT 2505 BG 4	Baltimore	3
CT 2505 BG 5	Baltimore	2
CT 2601.01 BG 1	Baltimore	3
CT 2601.01 BG 2	Baltimore	3
CT 2601.01 BG 3	Baltimore	3
CT 2601.01 BG 4	Baltimore	3
CT 2601.01 BG 5	Baltimore	3
CT 2601.02 BG 1	Baltimore	3
CT 2601.02 BG 2	Baltimore	1
CT 2601.02 BG 3	Baltimore	1
CT 2601.02 BG 4	Baltimore	3
CT 2601.02 BG 5	Baltimore	3
CT 2602.01 BG 1	Baltimore	1
CT 2602.01 BG 2	Baltimore	3
CT 2602.01 BG 3	Baltimore	1
CT 2602.01 BG 4	Baltimore	1
CT 2602.02 BG 1	Baltimore	2
CT 2602.02 BG 2	Baltimore	3
CT 2602.02 BG 3	Baltimore	1
CT 2602.02 BG 4	Baltimore	1
CT 2602.03 BG 1	Baltimore	1
CT 2602.03 BG 2	Baltimore	3
CT 2603.01 BG 1	Baltimore	1
CT 2603.01 BG 2	Baltimore	3
CT 2603.01 BG 3	Baltimore	1
CT 2603.01 BG 4	Baltimore	1
CT 2603.01 BG 5	Baltimore	1
CT 2603.02 BG 1	Baltimore	3
CT 2603.02 BG 2	Baltimore	1
CT 2603.02 BG 3	Baltimore	1
CT 2603.02 BG 4	Baltimore	1
CT 2603.02 BG 5	Baltimore	3
CT 2603.02 BG 6	Baltimore	1
CT 2603.03 BG 1	Baltimore	1
CT 2604.01 BG 1	Baltimore	1
CT 2604.01 BG 2	Baltimore	1
CT 2604.01 BG 3	Baltimore	2
CT 2604.02 BG 1	Baltimore	3
CT 2604.02 BG 2	Baltimore	1
CT 2604.03 BG 1	Baltimore	1
CT 2604.04 BG 2	Baltimore	3
CT 2604.04 BG 3	Baltimore	1
CT 2605.01 BG 1	Baltimore	1
CT 2605.01 BG 2	Baltimore	2
CT 2606.04 BG 1	Baltimore	1
CT 2606.04 BG 2	Baltimore	3
CT 2606.04 BG 3	Baltimore	1
CT 2606.05 BG 1	Baltimore	1
CT 2606.05 BG 2	Baltimore	2

Census Tract & Block Group ID	Place Name	Category
CT 2606.05 BG 3	Baltimore	1
CT 2606.05 BG 4	Baltimore	2
CT 2606.05 BG 5	Baltimore	2
CT 2607 BG 1	Baltimore	3
CT 2607 BG 2	Baltimore	1
CT 2608 BG 1	Baltimore	1
CT 2608 BG 2	Baltimore	1
CT 2610 BG 1	Baltimore	3
CT 2610 BG 2	Baltimore	1
CT 2610 BG 3	Baltimore	1
CT 2701.01 BG 2	Baltimore	3
CT 2701.02 BG 1	Baltimore	3
CT 2701.02 BG 2	Baltimore	1
CT 2701.02 BG 3	Baltimore	3
CT 2701.02 BG 4	Baltimore	3
CT 2702 BG 1	Baltimore	3
CT 2702 BG 3	Baltimore	3
CT 2703.01 BG 2	Baltimore	3
CT 2703.01 BG 3	Baltimore	1
CT 2703.01 BG 4	Baltimore	3
CT 2703.02 BG 2	Baltimore	3
CT 2704.01 BG 1	Baltimore	3
CT 2704.01 BG 3	Baltimore	1
CT 2704.01 BG 4	Baltimore	3
CT 2704.02 BG 1	Baltimore	3
CT 2704.02 BG 3	Baltimore	3
CT 2704.02 BG 4	Baltimore	3
CT 2705.01 BG 1	Baltimore	3
CT 2705.01 BG 4	Baltimore	3
CT 2705.02 BG 1	Baltimore	3
CT 2705.02 BG 2	Baltimore	3
CT 2705.02 BG 3	Baltimore	3
CT 2706 BG 2	Baltimore	3
CT 2706 BG 3	Baltimore	1
CT 2706 BG 4	Baltimore	3
CT 2706 BG 5	Baltimore	1
CT 2706 BG 6	Baltimore	3
CT 2707.01 BG 1	Baltimore	3
CT 2707.02 BG 1	Baltimore	1
CT 2707.02 BG 2	Baltimore	3
CT 2707.03 BG 3	Baltimore	3
CT 2708.01 BG 1	Baltimore	1
CT 2708.01 BG 2	Baltimore	3
CT 2708.01 BG 3	Baltimore	3
CT 2708.01 BG 4	Baltimore	3
CT 2708.02 BG 1	Baltimore	3
CT 2708.02 BG 2	Baltimore	3
CT 2708.02 BG 3	Baltimore	3
CT 2708.02 BG 4	Baltimore	1
CT 2708.02 BG 5	Baltimore	3
CT 2708.03 BG 1	Baltimore	3
CT 2708.03 BG 2	Baltimore	3
CT 2708.03 BG 3	Baltimore	3
CT 2708.04 BG 1	Baltimore	3

Census Tract & Block Group ID	Place Name	Category
CT 2708.04 BG 2	Baltimore	1
CT 2708.04 BG 4	Baltimore	3
CT 2708.05 BG 1	Baltimore	3
CT 2708.05 BG 2	Baltimore	1
CT 2708.05 BG 3	Baltimore	1
CT 2708.05 BG 4	Baltimore	3
CT 2708.05 BG 5	Baltimore	3
CT 2709.01 BG 1	Baltimore	3
CT 2709.01 BG 2	Baltimore	3
CT 2709.01 BG 3	Baltimore	3
CT 2709.02 BG 1	Baltimore	1
CT 2709.02 BG 2	Baltimore	3
CT 2709.02 BG 3	Baltimore	3
CT 2709.03 BG 1	Baltimore	3
CT 2709.03 BG 2	Baltimore	3
CT 2709.03 BG 3	Baltimore	3
CT 2710.01 BG 1	Baltimore	1
CT 2710.01 BG 2	Baltimore	1
CT 2710.01 BG 3	Baltimore	1
CT 2710.02 BG 1	Baltimore	1
CT 2710.02 BG 2	Baltimore	3
CT 2710.02 BG 3	Baltimore	1
CT 2710.02 BG 4	Baltimore	1
CT 2710.02 BG 5	Baltimore	1
CT 2711.01 BG 1	Baltimore	1
CT 2716 BG 1	Baltimore	1
CT 2716 BG 2	Baltimore	1
CT 2716 BG 3	Baltimore	1
CT 2716 BG 4	Baltimore	3
CT 2716 BG 5	Baltimore	1
CT 2716 BG 6	Baltimore	1
CT 2717 BG 1	Baltimore	1
CT 2717 BG 2	Baltimore	1
CT 2717 BG 3	Baltimore	3
CT 2717 BG 4	Baltimore	3
CT 2717 BG 5	Baltimore	3
CT 2717 BG 6	Baltimore	3
CT 2718.01 BG 1	Baltimore	3
CT 2718.01 BG 2	Baltimore	1
CT 2718.01 BG 3	Baltimore	1
CT 2718.02 BG 1	Baltimore	1
CT 2718.02 BG 2	Baltimore	1
CT 2718.02 BG 3	Baltimore	1
CT 2718.02 BG 4	Baltimore	1
CT 2719 BG 2	Baltimore	3
CT 2719 BG 3	Baltimore	3
CT 2719 BG 4	Baltimore	1
CT 2719 BG 5	Baltimore	3
CT 2720.03 BG 2	Baltimore	3
CT 2720.03 BG 5	Baltimore	3
CT 2720.04 BG 2	Baltimore	2
CT 2720.05 BG 2	Baltimore	2
CT 2720.06 BG 1	Baltimore	1
CT 2720.07 BG 1	Baltimore	1

Census Tract & Block Group ID	Place Name	Category
CT 2720.07 BG 2	Baltimore	2
CT 2720.07 BG 3	Baltimore	1
CT 2801.01 BG 1	Baltimore	3
CT 2801.01 BG 2	Baltimore	1
CT 2801.01 BG 3	Baltimore	1
CT 2801.02 BG 1	Baltimore	1
CT 2801.02 BG 2	Baltimore	1
CT 2801.02 BG 3	Baltimore	3
CT 2801.02 BG 4	Baltimore	3
CT 2801.02 BG 5	Baltimore	3
CT 2801.02 BG 6	Baltimore	3
CT 2802 BG 1	Baltimore	1
CT 2802 BG 2	Baltimore	1
CT 2802 BG 3	Baltimore	3
CT 2802 BG 4	Baltimore	3
CT 2802 BG 5	Baltimore	3
CT 2802 BG 6	Baltimore	3
CT 2803.01 BG 1	Baltimore	3
CT 2803.01 BG 2	Baltimore	3
CT 2803.01 BG 3	Baltimore	1
CT 2803.02 BG 1	Baltimore	3
CT 2803.02 BG 2	Baltimore	3
CT 2804.01 BG 1	Baltimore	1
CT 2804.01 BG 2	Baltimore	3
CT 2804.01 BG 3	Baltimore	1
CT 2804.01 BG 4	Baltimore	3
CT 2804.01 BG 5	Baltimore	3
CT 2804.02 BG 1	Baltimore	3
CT 2804.02 BG 2	Baltimore	1
CT 2804.03 BG 1	Baltimore	1
CT 2804.03 BG 2	Baltimore	1
CT 2804.03 BG 3	Baltimore	1
CT 2804.03 BG 4	Baltimore	3
CT 2804.03 BG 5	Baltimore	3
CT 2804.04 BG 1	Baltimore	1
CT 2804.04 BG 2	Baltimore	3
CT 2805 BG 1	Baltimore	1
CT 2805 BG 2	Baltimore	1
CT 2805 BG 3	Baltimore	1
CT 2805 BG 4	Baltimore	1
CT 301 BG 1	Baltimore	1
CT 301 BG 2	Baltimore	1
CT 302 BG 1	Baltimore	1
CT 401 BG 2	Baltimore	3
CT 402 BG 1	Baltimore	1
CT 601 BG 1	Baltimore	1
CT 601 BG 2	Baltimore	1
CT 601 BG 4	Baltimore	3
CT 602 BG 1	Baltimore	1
CT 602 BG 3	Baltimore	1
CT 602 BG 4	Baltimore	3
CT 602 BG 5	Baltimore	1
CT 603 BG 1	Baltimore	3
CT 604 BG 1	Baltimore	3

Census Tract & Block Group ID	Place Name	Category
CT 604 BG 2	Baltimore	3
CT 701 BG 1	Baltimore	1
CT 701 BG 2	Baltimore	1
CT 702 BG 1	Baltimore	1
CT 702 BG 2	Baltimore	1
CT 702 BG 3	Baltimore	1
CT 702 BG 4	Baltimore	1
CT 702 BG 5	Baltimore	3
CT 703 BG 1	Baltimore	1
CT 703 BG 2	Baltimore	1
CT 704 BG 1	Baltimore	1
CT 704 BG 2	Baltimore	1
CT 704 BG 3	Baltimore	1
CT 801.01 BG 2	Baltimore	3
CT 801.01 BG 3	Baltimore	1
CT 801.01 BG 4	Baltimore	3
CT 801.02 BG 1	Baltimore	1
CT 801.02 BG 2	Baltimore	1
CT 802 BG 1	Baltimore	3
CT 802 BG 2	Baltimore	1
CT 802 BG 3	Baltimore	1
CT 803.01 BG 1	Baltimore	1
CT 803.01 BG 2	Baltimore	1
CT 803.01 BG 3	Baltimore	1
CT 803.02 BG 1	Baltimore	1
CT 803.02 BG 2	Baltimore	1
CT 803.02 BG 3	Baltimore	1
CT 803.02 BG 4	Baltimore	1
CT 804 BG 1	Baltimore	1
CT 804 BG 2	Baltimore	1
CT 805 BG 1	Baltimore	1
CT 805 BG 2	Baltimore	3
CT 805 BG 3	Baltimore	1
CT 806 BG 1	Baltimore	1
CT 806 BG 2	Baltimore	1
CT 806 BG 3	Baltimore	3
CT 806 BG 4	Baltimore	3
CT 807 BG 1	Baltimore	1
CT 807 BG 2	Baltimore	1
CT 808 BG 1	Baltimore	1
CT 808 BG 2	Baltimore	1
CT 901 BG 1	Baltimore	1
CT 901 BG 2	Baltimore	3
CT 901 BG 4	Baltimore	1
CT 901 BG 5	Baltimore	1
CT 902 BG 1	Baltimore	3
CT 902 BG 2	Baltimore	3
CT 903 BG 1	Baltimore	3
CT 903 BG 2	Baltimore	1
CT 903 BG 3	Baltimore	3
CT 903 BG 4	Baltimore	1
CT 904 BG 1	Baltimore	1
CT 904 BG 2	Baltimore	1
CT 905 BG 1	Baltimore	3

Census Tract & Block Group ID	Place Name	Category
CT 905 BG 2	Baltimore	1
CT 906 BG 1	Baltimore	1
CT 906 BG 2	Baltimore	1
CT 906 BG 3	Baltimore	1
CT 906 BG 4	Baltimore	3
CT 907 BG 1	Baltimore	1
CT 907 BG 2	Baltimore	1
CT 907 BG 3	Baltimore	1
CT 907 BG 4	Baltimore	1
CT 908 BG 1	Baltimore	1
CT 908 BG 2	Baltimore	1
CT 908 BG 3	Baltimore	1
CT 908 BG 4	Baltimore	1
CT 908 BG 5	Baltimore	1
CT 909 BG 1	Baltimore	1
CT 909 BG 2	Baltimore	1
CT 909 BG 3	Baltimore	1
CT 909 BG 4	Baltimore	1

Table G-EJ22. Census Tracts (CT) and Block Groups (BG) in Anne Arundel County, Maryland (County ID 24-003) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.

Census Tract & Block Group ID	Place Name	Category
CT 7011.01 BG 1	Riva	2
CT 7011.01 BG 3	Edgewater	2
CT 7011.02 BG 2	Edgewater	2
CT 7011.02 BG 3	Edgewater	1
CT 7011.02 BG 4	Edgewater	2
CT 7013 BG 3	Un-named Area	1
CT 7014 BG 1	Un-named Area	2
CT 7021 BG 2	Herald Harbor	2
CT 7021 BG 3	Crownsville	2
CT 7022.05 BG 2	Crofton	3
CT 7022.06 BG 1	Crofton	3
CT 7022.06 BG 2	Crofton	3
CT 7022.08 BG 1	Crofton	3
CT 7024.02 BG 1	Parole	2
CT 7025 BG 1	Annapolis Neck	2
CT 7025 BG 2	Annapolis	1
CT 7025 BG 3	Annapolis	1
CT 7025 BG 4	Annapolis Neck	2
CT 7026.01 BG 1	Annapolis Neck	2
CT 7026.01 BG 5	Annapolis	1
CT 7026.02 BG 3	Annapolis Neck	3
CT 7027.01 BG 1	Parole	1
CT 7061.01 BG 2	Annapolis	2
CT 7061.01 BG 3	Annapolis	1
CT 7063.01 BG 1	Annapolis Neck	3
CT 7063.01 BG 2	Annapolis	1
CT 7063.02 BG 1	Annapolis	2
CT 7063.02 BG 2	Annapolis	2
CT 7064.01 BG 1	Annapolis	1
CT 7064.01 BG 2	Annapolis	1
CT 7064.01 BG 3	Annapolis	1
CT 7064.02 BG 1	Annapolis	1
CT 7064.02 BG 2	Annapolis	1
CT 7065 BG 1	Annapolis	1
CT 7065 BG 2	Annapolis	1
CT 7065 BG 3	Annapolis	1
CT 7066 BG 5	Annapolis	1
CT 7067 BG 1	Naval Academy	1
CT 7070.01 BG 1	Shady Side	2
CT 7070.01 BG 3	Shady Side	3
CT 7080.04 BG 1	Un-named Area	2
CT 7080.04 BG 3	Un-named Area	1
CT 7302.03 BG 1	Glen Burnie	2
CT 7302.03 BG 2	Glen Burnie	1
CT 7302.03 BG 3	Glen Burnie	1
CT 7302.03 BG 4	Glen Burnie	1
CT 7302.04 BG 1	Glen Burnie	3
CT 7302.04 BG 2	Glen Burnie	1
CT 7302.04 BG 3	Glen Burnie	1
CT 7304.01 BG 1	Glen Burnie	3
CT 7304.01 BG 2	Glen Burnie	2
CT 7304.02 BG 1	Glen Burnie	1
CT 7304.02 BG 2	Glen Burnie	2
CT 7304.02 BG 3	Glen Burnie	2
CT 7305.02 BG 1	Glen Burnie	2
CT 7305.02 BG 2	Glen Burnie	1
CT 7305.02 BG 3	Glen Burnie	3
CT 7305.04 BG 1	Glen Burnie	3
CT 7305.04 BG 2	Glen Burnie	1
CT 7305.04 BG 3	Glen Burnie	3
CT 7305.05 BG 1	Glen Burnie	1
CT 7305.05 BG 2	Glen Burnie	1
CT 7305.06 BG 1	Glen Burnie	1
CT 7305.06 BG 2	Glen Burnie	1
CT 7305.06 BG 3	Glen Burnie	1
CT 7307 BG 3	Severna Park	2
CT 7307 BG 5	Severna Park	2
CT 7309.01 BG 3	Un-named Area	2

Census Tract & Block Group ID	Place Name	Category
CT 7310.03 BG 1	Cape St. Claire	2
CT 7310.04 BG 1	Cape St. Claire	2
CT 7311.02 BG 1	Arnold	2
CT 7311.04 BG 2	Arnold	2
CT 7312.02 BG 2	Lake Shore	2
CT 7312.03 BG 4	Severna Park	3
CT 7312.03 BG 5	Severna Park	3
CT 7312.04 BG 1	Pasadena	2
CT 7313.03 BG 1	Lake Shore	2
CT 7313.03 BG 4	Un-named Area	2
CT 7313.06 BG 1	Un-named Area	2
CT 7313.07 BG 1	Lake Shore	2
CT 7313.07 BG 2	Lake Shore	2
CT 7313.08 BG 2	Riviera Beach	2
CT 7313.09 BG 1	Riviera Beach	2
CT 7313.09 BG 3	Riviera Beach	2
CT 7313.1 BG 1	Pasadena	2
CT 7313.1 BG 3	Pasadena	2
CT 7313.11 BG 3	Pasadena	2
CT 7401.02 BG 1	Un-named Area	3
CT 7401.02 BG 2	Severn	3
CT 7401.03 BG 1	Severn	3
CT 7401.03 BG 2	Severn	3
CT 7401.03 BG 3	Severn	3
CT 7401.03 BG 4	Severn	3
CT 7401.04 BG 1	Severn	3
CT 7401.04 BG 2	Severn	1
CT 7401.04 BG 3	Severn	1
CT 7401.05 BG 1	Severn	1
CT 7401.05 BG 2	Severn	1
CT 7402.01 BG 2	Severn	1
CT 7402.01 BG 3	Severn	3
CT 7402.01 BG 4	Glen Burnie	1
CT 7402.03 BG 2	Severn	3
CT 7403.03 BG 1	Severn	2
CT 7403.03 BG 2	Severn	3
CT 7403.04 BG 1	Odenton	3
CT 7403.05 BG 1	Odenton	1
CT 7403.05 BG 2	Odenton	1
CT 7403.05 BG 3	Severn	1
CT 7403.05 BG 4	Odenton	3
CT 7404 BG 1	Jessup	3
CT 7405 BG 1	Maryland City	3
CT 7405 BG 2	Maryland City	3
CT 7405 BG 3	Maryland City	1
CT 7406.01 BG 1	Fort Meade	3
CT 7406.01 BG 2	Fort Meade	3
CT 7406.01 BG 3	Fort Meade	1
CT 7406.01 BG 4	Fort Meade	1

Census Tract & Block Group ID	Place Name	Category
CT 7406.02 BG 1	Fort Meade	1
CT 7406.02 BG 2	Fort Meade	1
CT 7406.03 BG 2	Fort Meade	1
CT 7407.01 BG 1	Odenton	1
CT 7407.01 BG 2	Odenton	3
CT 7407.02 BG 1	Odenton	3
CT 7407.02 BG 2	Un-named Area	3
CT 7409 BG 1	Odenton	1
CT 7409 BG 2	Odenton	2
CT 7409 BG 3	Odenton	3
CT 7501.01 BG 1	Brooklyn Park	1
CT 7501.01 BG 2	Brooklyn Park	2
CT 7501.01 BG 3	Brooklyn Park	1
CT 7501.01 BG 4	Brooklyn Park	1
CT 7501.02 BG 1	Brooklyn Park	1
CT 7501.02 BG 2	Brooklyn Park	2
CT 7502.01 BG 1	Brooklyn Park	3
CT 7502.01 BG 2	Brooklyn Park	1
CT 7502.02 BG 1	Brooklyn Park	2
CT 7502.02 BG 2	Brooklyn Park	1
CT 7502.03 BG 1	Brooklyn Park	2
CT 7503 BG 2	Linthicum	2
CT 7508.01 BG 3	Ferndale	2
CT 7508.03 BG 1	Ferndale	1
CT 7508.03 BG 2	Ferndale	2
CT 7508.03 BG 3	Ferndale	1
CT 7508.03 BG 4	Ferndale	1
CT 7508.03 BG 5	Ferndale	1
CT 7508.04 BG 1	Ferndale	1
CT 7508.04 BG 2	Ferndale	2
CT 7509 BG 1	Glen Burnie	2
CT 7509 BG 2	Glen Burnie	1
CT 7510 BG 1	Glen Burnie	2
CT 7510 BG 2	Glen Burnie	1
CT 7510 BG 3	Glen Burnie	2
CT 7511.02 BG 1	Glen Burnie	1
CT 7511.02 BG 2	Glen Burnie	2
CT 7511.03 BG 1	Glen Burnie	2
CT 7511.03 BG 3	Glen Burnie	2
CT 7511.03 BG 4	Glen Burnie	2
CT 7512 BG 3	Un-named Area	3
CT 7514 BG 1	Severn	3
CT 7514 BG 2	Un-named Area	3
CT 7515 BG 1	Maryland City	3
CT 7515 BG 2	Maryland City	1
CT 7515 BG 3	Maryland City	1
CT 7515 BG 4	Maryland City	1
CT 7516 BG 2	Crownsville	2
CT 9800 BG 1	Un-named Area	3

Table G-EJ23. Census Tracts (CT) and Block Groups (BG) in Norfolk, Virginia (County ID 51-710) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.
Note that Norfolk is an independent city in Virginia and is considered the equivalent of a county.

Census Tract & Block Group ID	Place Name	Category
CT 1 BG 1	Norfolk	2
CT 1 BG 2	Norfolk	2
CT 11 BG 1	Norfolk	1
CT 11 BG 2	Norfolk	1
CT 12 BG 2	Norfolk	1
CT 13 BG 1	Norfolk	3
CT 13 BG 2	Norfolk	1
CT 14 BG 1	Norfolk	1
CT 14 BG 2	Norfolk	2
CT 15 BG 2	Norfolk	3
CT 16 BG 1	Norfolk	1
CT 16 BG 2	Norfolk	1
CT 17 BG 2	Norfolk	3
CT 2.01 BG 1	Norfolk	2
CT 2.01 BG 2	Norfolk	2
CT 2.02 BG 2	Norfolk	2
CT 2.02 BG 3	Norfolk	2
CT 24 BG 3	Norfolk	2
CT 25 BG 1	Norfolk	1
CT 25 BG 2	Norfolk	1
CT 26 BG 1	Norfolk	1
CT 26 BG 2	Norfolk	1
CT 27 BG 1	Norfolk	1
CT 27 BG 2	Norfolk	1
CT 27 BG 3	Norfolk	1
CT 28 BG 2	Norfolk	2
CT 29 BG 1	Norfolk	1
CT 29 BG 2	Norfolk	1
CT 29 BG 3	Norfolk	1
CT 29 BG 4	Norfolk	1
CT 3 BG 2	Norfolk	3
CT 3 BG 3	Norfolk	3
CT 30 BG 1	Norfolk	2
CT 31 BG 1	Norfolk	3
CT 31 BG 2	Norfolk	1
CT 31 BG 3	Norfolk	1
CT 32 BG 1	Norfolk	1
CT 32 BG 2	Norfolk	1
CT 32 BG 3	Norfolk	1
CT 33 BG 1	Norfolk	1
CT 33 BG 2	Norfolk	1
CT 34 BG 1	Norfolk	1
CT 34 BG 2	Norfolk	1
CT 35.01 BG 1	Norfolk	1
CT 35.01 BG 2	Norfolk	1
CT 35.01 BG 3	Norfolk	1
CT 35.01 BG 4	Norfolk	1
CT 37 BG 1	Norfolk	2
CT 38 BG 1	Norfolk	2
CT 4 BG 3	Norfolk	2
CT 40.02 BG 4	Norfolk	2
CT 41 BG 1	Norfolk	1
CT 42 BG 1	Norfolk	1
CT 42 BG 2	Norfolk	1
CT 43 BG 1	Norfolk	1
CT 43 BG 2	Norfolk	1
CT 43 BG 3	Norfolk	1
CT 43 BG 4	Norfolk	1
CT 44 BG 1	Norfolk	1
CT 44 BG 2	Norfolk	3
CT 44 BG 3	Norfolk	1
CT 45 BG 1	Norfolk	3
CT 46 BG 1	Norfolk	1
CT 46 BG 2	Norfolk	1
CT 47 BG 1	Norfolk	3
CT 47 BG 2	Norfolk	1
CT 48 BG 1	Norfolk	1
CT 49 BG 2	Norfolk	3
CT 5 BG 1	Norfolk	1
CT 5 BG 4	Norfolk	2
CT 50 BG 1	Norfolk	1
CT 50 BG 2	Norfolk	1
CT 50 BG 3	Norfolk	1
CT 51 BG 1	Norfolk	3
CT 51 BG 2	Norfolk	1
CT 51 BG 3	Norfolk	1
CT 55 BG 1	Norfolk	1
CT 55 BG 2	Norfolk	1
CT 55 BG 3	Norfolk	1
CT 56.02 BG 2	Norfolk	1
CT 57.01 BG 1	Norfolk	1
CT 57.01 BG 2	Norfolk	1
CT 57.01 BG 3	Norfolk	1
CT 57.02 BG 1	Norfolk	1
CT 57.02 BG 2	Norfolk	3
CT 58 BG 1	Norfolk	1
CT 58 BG 2	Norfolk	1
CT 58 BG 3	Norfolk	3
CT 59.01 BG 1	Norfolk	3
CT 59.01 BG 2	Norfolk	1
CT 59.01 BG 3	Norfolk	1
CT 59.02 BG 1	Norfolk	3
CT 59.02 BG 2	Norfolk	3
CT 59.02 BG 4	Norfolk	1

Census Tract & Block Group ID	Place Name	Category
CT 59.03 BG 1	Norfolk	1
CT 6 BG 1	Norfolk	3
CT 6 BG 3	Norfolk	1
CT 60 BG 1	Norfolk	1
CT 60 BG 2	Norfolk	1
CT 61 BG 1	Norfolk	1
CT 61 BG 2	Norfolk	3
CT 61 BG 3	Norfolk	1
CT 61 BG 4	Norfolk	3
CT 61 BG 5	Norfolk	2
CT 62 BG 1	Norfolk	3
CT 62 BG 2	Norfolk	2
CT 64 BG 1	Norfolk	3
CT 64 BG 2	Norfolk	1
CT 65.01 BG 1	Norfolk	2
CT 65.01 BG 2	Norfolk	2

Census Tract & Block Group ID	Place Name	Category
CT 65.02 BG 2	Norfolk	1
CT 66.05 BG 2	Norfolk	1
CT 66.06 BG 1	Norfolk	1
CT 66.06 BG 3	Norfolk	1
CT 66.07 BG 1	Norfolk	3
CT 66.07 BG 2	Norfolk	2
CT 69.01 BG 1	Norfolk	3
CT 69.01 BG 2	Norfolk	3
CT 69.01 BG 3	Norfolk	3
CT 69.02 BG 1	Norfolk	1
CT 70.01 BG 1	Norfolk	1
CT 70.02 BG 1	Norfolk	1
CT 70.02 BG 2	Norfolk	3
CT 8 BG 2	Norfolk	1
CT 9.01 BG 1	Norfolk	2
CT 9.02 BG 1	Norfolk	2

Table G-EJ24. Census Tracts (CT) and Block Groups (BG) in Newport News, Virginia (County ID 51-700) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.
Note that Newport News is an independent city in Virginia and is considered the equivalent of a county.

Census Tract & Block Group ID	Place Name	Category
CT 301 BG 1	Newport News	1
CT 301 BG 2	Newport News	1
CT 301 BG 3	Newport News	1
CT 303 BG 1	Newport News	1
CT 303 BG 2	Newport News	3
CT 303 BG 3	Newport News	1
CT 303 BG 4	Newport News	1
CT 303 BG 5	Newport News	1
CT 303 BG 6	Newport News	1
CT 303 BG 7	Newport News	3
CT 304 BG 1	Newport News	1
CT 304 BG 2	Newport News	1
CT 304 BG 3	Newport News	1
CT 304 BG 4	Newport News	1
CT 305 BG 1	Newport News	1
CT 305 BG 2	Newport News	1
CT 306 BG 1	Newport News	1
CT 306 BG 2	Newport News	1
CT 306 BG 3	Newport News	1
CT 308 BG 1	Newport News	1
CT 308 BG 2	Newport News	1
CT 308 BG 3	Newport News	1
CT 309 BG 1	Newport News	1
CT 309 BG 2	Newport News	1
CT 311 BG 1	Newport News	1
CT 311 BG 2	Newport News	1

Census Tract & Block Group ID	Place Name	Category
CT 312 BG 1	Newport News	2
CT 312 BG 2	Newport News	1
CT 313 BG 1	Newport News	1
CT 313 BG 2	Newport News	1
CT 313 BG 3	Newport News	1
CT 313 BG 4	Newport News	1
CT 314 BG 3	Newport News	3
CT 314 BG 4	Newport News	1
CT 315 BG 1	Newport News	2
CT 316.01 BG 2	Newport News	1
CT 316.01 BG 3	Newport News	1
CT 316.02 BG 1	Newport News	1
CT 317.01 BG 1	Newport News	1
CT 317.01 BG 2	Newport News	2
CT 319.02 BG 1	Newport News	3
CT 319.02 BG 3	Newport News	1
CT 320.06 BG 1	Newport News	1
CT 320.06 BG 2	Newport News	1
CT 320.06 BG 3	Newport News	1
CT 320.07 BG 1	Newport News	3
CT 320.07 BG 2	Newport News	3
CT 321.13 BG 1	Newport News	1
CT 321.17 BG 2	Newport News	2
CT 321.23 BG 1	Newport News	1
CT 321.23 BG 2	Newport News	3
CT 321.23 BG 3	Newport News	2

Census Tract & Block Group ID	Place Name	Category
CT 321.24 BG 1	Newport News	1
CT 321.24 BG 2	Newport News	3
CT 321.26 BG 1	Newport News	1
CT 321.26 BG 2	Newport News	1
CT 321.27 BG 1	Newport News	2
CT 321.27 BG 2	Newport News	3
CT 321.27 BG 3	Newport News	1
CT 321.28 BG 1	Newport News	3
CT 321.28 BG 2	Newport News	1
CT 321.29 BG 1	Newport News	3
CT 321.29 BG 2	Newport News	1
CT 321.31 BG 1	Newport News	3
CT 321.31 BG 3	Newport News	1
CT 321.32 BG 4	Newport News	3
CT 322.11 BG 3	Newport News	3
CT 322.12 BG 1	Newport News	1
CT 322.12 BG 2	Newport News	3

Census Tract & Block Group ID	Place Name	Category
CT 322.12 BG 3	Newport News	1
CT 322.23 BG 1	Newport News	3
CT 322.23 BG 2	Newport News	3
CT 322.23 BG 3	Newport News	3
CT 322.24 BG 1	Newport News	1
CT 322.24 BG 2	Newport News	1
CT 322.24 BG 3	Newport News	3
CT 322.24 BG 4	Newport News	3
CT 322.25 BG 1	Newport News	1
CT 322.25 BG 2	Newport News	1
CT 322.26 BG 1	Newport News	1
CT 322.26 BG 2	Newport News	1
CT 323 BG 2	Newport News	1
CT 323 BG 3	Newport News	1
CT 324 BG 1	Newport News	1
CT 324 BG 2	Newport News	1

Table G-EJ25. Census Tracts (CT) and Block Groups (BG) in Hampton, Virginia (County ID 51-650) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.
Note that Hampton is an independent city in Virginia and is considered the equivalent of a county.

Census Tract & Block Group ID	Place Name	Category
CT 101.03 BG 1	Hampton	3
CT 101.03 BG 3	Hampton	3
CT 101.04 BG 2	Hampton	2
CT 101.04 BG 4	Hampton	1
CT 101.04 BG 5	Hampton	1
CT 103.04 BG 1	Hampton	3
CT 103.04 BG 2	Hampton	3
CT 103.04 BG 3	Hampton	3
CT 103.06 BG 2	Hampton	1
CT 103.06 BG 3	Hampton	1
CT 103.07 BG 1	Hampton	3
CT 103.07 BG 2	Hampton	3
CT 103.09 BG 2	Hampton	3
CT 103.09 BG 3	Hampton	1
CT 103.1 BG 1	Hampton	3
CT 103.11 BG 1	Hampton	1
CT 103.11 BG 2	Hampton	3
CT 103.13 BG 1	Hampton	3
CT 103.13 BG 2	Hampton	1
CT 103.13 BG 3	Hampton	3
CT 103.13 BG 4	Hampton	1
CT 103.14 BG 1	Hampton	3
CT 103.14 BG 2	Hampton	1
CT 104 BG 1	Hampton	1
CT 104 BG 2	Hampton	1
CT 104 BG 3	Hampton	1

Census Tract & Block Group ID	Place Name	Category
CT 104 BG 4	Hampton	1
CT 104 BG 5	Hampton	2
CT 105.01 BG 1	Hampton	1
CT 105.01 BG 2	Hampton	1
CT 105.01 BG 3	Hampton	1
CT 105.02 BG 1	Hampton	1
CT 105.02 BG 2	Hampton	1
CT 106.01 BG 1	Hampton	1
CT 106.01 BG 2	Hampton	1
CT 106.02 BG 1	Hampton	1
CT 106.02 BG 2	Hampton	1
CT 107.01 BG 1	Hampton	2
CT 107.01 BG 2	Hampton	1
CT 107.02 BG 1	Hampton	2
CT 107.02 BG 2	Hampton	1
CT 107.03 BG 2	Hampton	2
CT 108 BG 1	Hampton	1
CT 108 BG 2	Hampton	1
CT 109 BG 1	Hampton	1
CT 110 BG 1	Hampton	2
CT 110 BG 2	Hampton	1
CT 110 BG 3	Hampton	1
CT 112 BG 1	Hampton	1
CT 112 BG 2	Hampton	2
CT 112 BG 3	Hampton	2
CT 113 BG 1	Hampton	1

Census Tract & Block Group ID	Place Name	Category
CT 113 BG 2	Hampton	1
CT 114 BG 1	Hampton	1
CT 114 BG 2	Hampton	3
CT 116 BG 1	Hampton	1
CT 116 BG 2	Hampton	1
CT 116 BG 3	Hampton	1
CT 118 BG 1	Hampton	1
CT 118 BG 2	Hampton	1
CT 118 BG 3	Hampton	1

Census Tract & Block Group ID	Place Name	Category
CT 118 BG 5	Hampton	1
CT 118 BG 6	Hampton	3
CT 119 BG 1	Hampton	1
CT 119 BG 2	Hampton	3
CT 119 BG 3	Hampton	1
CT 120 BG 1	Hampton	1
CT 120 BG 2	Hampton	1

Table G-EJ26. Census Tracts (CT) and Block Groups (BG) in Portsmouth, Virginia (County ID 51-740) That Are Potential Environmental Justice Areas of Concern Due to Concentrations of Minority and/or Low-Income Populations

Category 1—low-income percentage exceeds the percentage for the county; Category 2—minority population exceeds the percentage for the county; Category 3—both low-income and minority populations exceed the percentages for the county.
Note that Portsmouth is an independent city in Virginia and is considered the equivalent of a county.

Census Tract & Block Group ID	Place Name	Category
CT 2103 BG 1	Portsmouth	3
CT 2103 BG 2	Portsmouth	2
CT 2105 BG 1	Portsmouth	1
CT 2106 BG 2	Portsmouth	2
CT 2109 BG 1	Portsmouth	3
CT 2111 BG 1	Portsmouth	1
CT 2111 BG 2	Portsmouth	1
CT 2114 BG 1	Portsmouth	1
CT 2114 BG 2	Portsmouth	1
CT 2115 BG 1	Portsmouth	1
CT 2115 BG 2	Portsmouth	1
CT 2116 BG 3	Portsmouth	2
CT 2117 BG 1	Portsmouth	3
CT 2117 BG 2	Portsmouth	1
CT 2117 BG 3	Portsmouth	1
CT 2118 BG 1	Portsmouth	1
CT 2118 BG 2	Portsmouth	1
CT 2118 BG 3	Portsmouth	1
CT 2118 BG 4	Portsmouth	1
CT 2119 BG 1	Portsmouth	1
CT 2119 BG 2	Portsmouth	3
CT 2120 BG 1	Portsmouth	1
CT 2120 BG 2	Portsmouth	1
CT 2121 BG 1	Portsmouth	1
CT 2121 BG 2	Portsmouth	1
CT 2123 BG 1	Portsmouth	1
CT 2123 BG 2	Portsmouth	3
CT 2123 BG 3	Portsmouth	3

Census Tract & Block Group ID	Place Name	Category
CT 2123 BG 4	Portsmouth	1
CT 2124 BG 1	Portsmouth	1
CT 2124 BG 2	Portsmouth	3
CT 2124 BG 3	Portsmouth	1
CT 2125 BG 1	Portsmouth	1
CT 2126 BG 1	Portsmouth	1
CT 2126 BG 2	Portsmouth	2
CT 2127.01 BG 1	Portsmouth	1
CT 2127.01 BG 2	Portsmouth	3
CT 2127.01 BG 3	Portsmouth	3
CT 2127.01 BG 4	Portsmouth	3
CT 2127.02 BG 1	Portsmouth	3
CT 2127.02 BG 2	Portsmouth	1
CT 2128.01 BG 2	Portsmouth	1
CT 2128.01 BG 3	Portsmouth	3
CT 2129 BG 2	Portsmouth	2
CT 2129 BG 3	Portsmouth	2
CT 2131.01 BG 1	Portsmouth	1
CT 2131.01 BG 2	Portsmouth	1
CT 2131.01 BG 3	Portsmouth	3
CT 2131.03 BG 3	Portsmouth	3
CT 2131.03 BG 4	Portsmouth	3
CT 2131.03 BG 5	Portsmouth	3
CT 2131.04 BG 1	Portsmouth	3
CT 2131.04 BG 2	Portsmouth	3
CT 2132 BG 1	Portsmouth	3
CT 2132 BG 2	Portsmouth	1
CT 9801 BG 1	Portsmouth	3

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Electromagnetic Fields

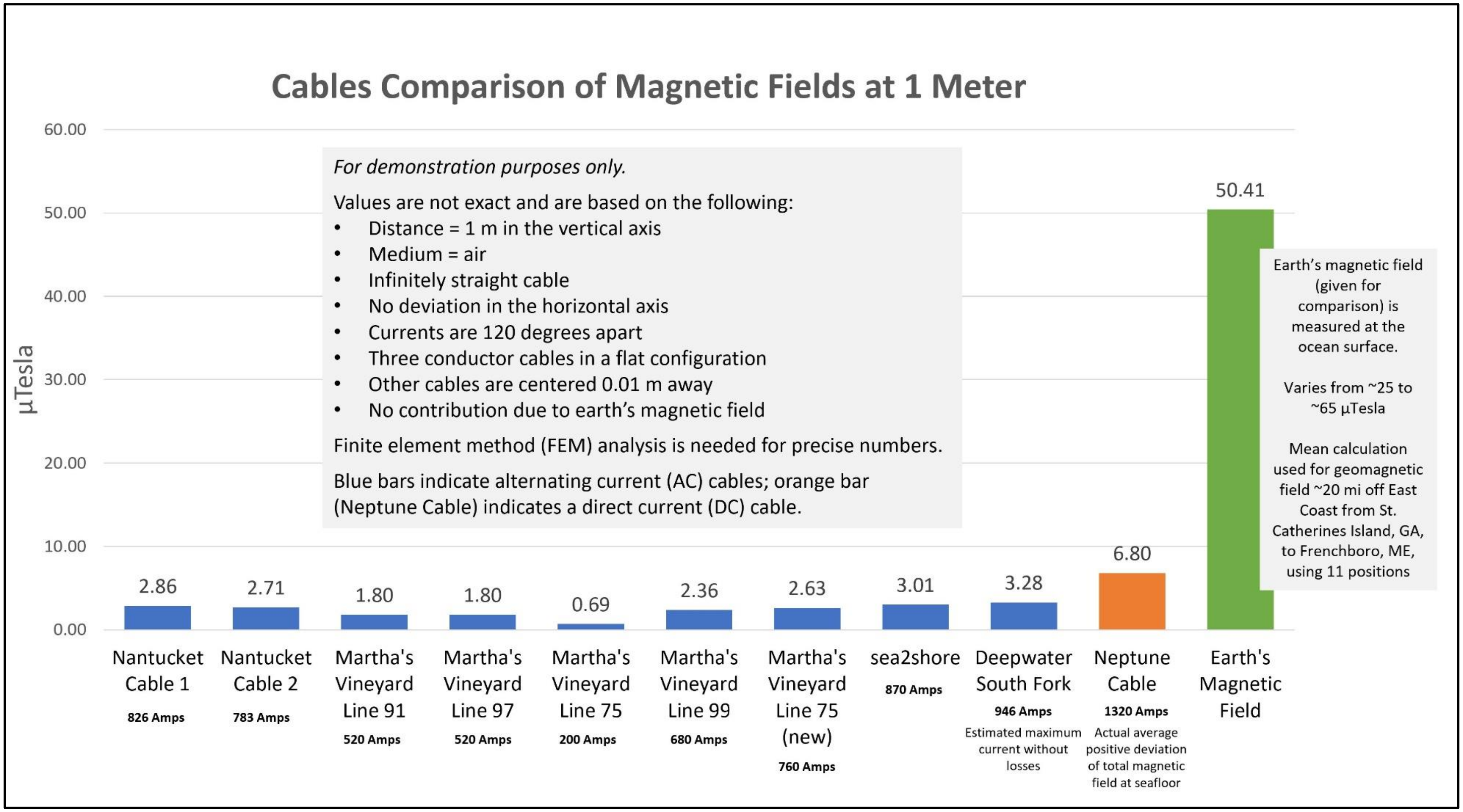

Figure G-34. Comparison of electromagnetic fields produced by offshore wind farm transmission cables to the Earth's background magnetic field.

Visual Resources

Visual resources impacts associated with the RWF were evaluated and determined based on information and findings associated with the RWF visual impact assessment (VIA) (EDR 2021) and the application of BOEM's Assessment of *Seascape, Landscape, and Visual Impacts of Offshore Wind Energy Developments on the Outer Continental Shelf of the United States* methodology (Sullivan 2021), also known as seascape, landscape, and visual impacts assessment (SLVIA). At the request of BOEM, the SLVIA methodology for determination of impacts to key observation points (KOPs) (comprising the VIA component of the SLVIA) and impacts to character areas (ocean [OCA], seascapes [SCA] and landscapes [LCA]) (comprising the seascape and landscape impacts assessment [SLIA] component of the SLVIA) was applied (Sullivan 2021:29–33) to previously documented evaluation and impact methodologies associated with the RWF VIA.

The SLVIA impact methodology was crosswalked with the RWF VIA to extract previously documented existing views and proposed Project visual conditions and information associated with the Proposed Action (Table G-40 and G-41). KOP information and character area information associated with the 2021 Visual Impact Assessment was also extracted and applied to Alternatives B, C, D, and E and compiled in Tables G-42 thru G-47 to provide a consistent baseline of information related to determination of impacts associated with KOPs and character areas in relation to the Proposed Action for comparison purposes.

Up to 37 viewing condition scenarios (e.g., daytime, sunset and nighttime) associated with 28 individual KOPs were evaluated for each action alternative associated with the VIA component of the SLVIA (VIA Tables G-40a thru G-40b, G-42, G-44a thru G-44b and G-46). Not all KOPs were evaluated for all action alternatives. The orientation of specific KOPs in relation to action alternatives were reviewed and selected for further analysis based on geographic proximity of each action alternative. Each table combines the sensitivity rating based on a location's susceptibility to change and its perceived value to society based on information from the RWF VIA as well as the magnitude rating consisting of size or scale of the change associated with the proposed Project, the geographic extent of the change, and the duration and reversibility of the change for each KOP, for an overall impact determination finding of major, moderate, minor, or negligible (Sullivan 2021), which correspond to impacts described in the EIS. Cumulative impacts associated with KOPs (VIA Table G-48) have been evaluated and identify the level of impact associated with the contribution of the Proposed Action to the No Action Alternative.

Impacts associated with the SLIA component of the analysis (SLIA Tables G-41a thru G-41e, G-43a thru G-43c, G-45a thru G-45c and G-47a thru G-47c) crosswalk and categorize landscape similarity zones as described in the RWF VIA with SLVIA character area descriptions to provide a general understating of OCA, SCA and LCA relationships. Visibility analyses to determine the overall character area visibility associated with each alternative in comparison to the Proposed Action to provide a basis for impact determination is included in each table. Impacts to Specially Designated Areas have also been included in each SLIA table and categorized based on Specially Designated Area type.

Impact findings are based on the best available information associated with the RWF VIA for the action alternatives, and some deviation between the RWF VIA impact findings and the SLVIA impacts findings as applied in the following tables may occur due to differences in methodological approaches.

Table G-40a. Visual Impact Assessment Impact Matrix for Alternative B (Proposed Action) (see Table G-40b for continuation table)

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Lighting Angle of Proposed Action Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLVIA Sensitivity Rating Rationale	SLVIA Sensitivity Rating (high, medium, low)
AI01	Brenton Point State Park	SCA/LCA	South-Southeast	34.9	Sidelit	VTL2	16.7/14.5	180	Landscape is characteristic of recreational development; seascape appears intact	Low	Local Residents, Tourists/Vacationers, Fishing Community Newport/Ocean Drive State Scenic Area, Brenton Point State Park, Rhode Island Historic District, Ocean Drive National Historic Landmark	High	Popular destination for residents and tourists who enjoy sightseeing, recreating, and sunbathing.	Medium
AI01	Brenton Point State Park - Night	SCA/LCA	South-Southeast	34.9	N/A	VTL2	16.7/14.5	180	Night seascape appears intact	Medium	Local Residents, Tourists/Vacationers, Fishing Community Newport/Ocean Drive State Scenic Area, Brenton Point State Park, Rhode Island Historic District, Ocean Drive National Historic Landmark	High	Popular destination for residents and tourists who enjoy sightseeing.	High
AI03	Newport Cliff Walk	SCA/LCA	Southeast to South-Southeast	22.8	Sidelit	VTL3	15.3/13.3	180	Landscape is characteristic of natural areas and minimal recreational development; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark	High	Popular among residents and tourists, particularly during the summer season. No other human-made features are visible.	High
AI05	Sachuest Point National Wildlife Refuge	LCA	South-Southeast	21.7	Variable	VTL4	14.8/12.9	180	Landscape is characteristic of natural areas and minimal recreational development; seascape appears intact	Medium	Local Residents, Tourists/Vacationers; Educational, Birders Sachuest Point National Wildlife Refuge, Sachuest Point State Scenic Area	High	Popular destination for hikers, fishermen, and nature enthusiasts, particularly birders	High
AI06	Sachuest Beach (Second Beach)	SCA	South-Southeast to South	10.2	Sidelit	VTL3	16.0/13.9	160	Landscape is characteristic of minimal shoreline recreational development; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Sachuest Beach (Second Beach), Narragansett Bay	Medium	Residents and vacationers regularly use Second Beach, particularly during the summer.	Medium
AI07	Hanging Rock (Norman Bird Sanctuary)	LCA	Southeast to South-Southeast	67.3	Backlit	VTL5	16.2/14.1	160	Landscape has infrastructure development and recreational development; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Norman Bird Sanctuary, Paradise Avenue and Associated Roads, State Scenic Byway, Second Beach, Paradise Rocks Rhode Island Historic District	High	Popular destination for residents and tourists who enjoy birdwatching, sightseeing, recreating, and sunbathing.	High
BI04	Southeast Lighthouse	SCA	East	161.1	Sidelit	VTL2	15.3/13.3	180	Landscape has characteristic historic lighthouse setting with supporting development; BIWF is visible (3 miles)	High	Local Residents, Tourists/Vacationers Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area	High	Maintenance of views from historic landmark and scenic area; user groups	High

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Lighting Angle of Proposed Action Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLVIA Sensitivity Rating Rationale	SLVIA Sensitivity Rating (high, medium, low)
BI04	Southeast Lighthouse - Night	SCA	East	161.1	N/A	VTL 4	15.3/13.4	180	Night seascape appears intact	High	Local Residents, Tourists/Vacationers Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area	High	Maintenance of views from historic landmark and scenic area; user groups	High
BI12	Clayhead Trail	SCA	East	78.8	Sidelit	VTL1	15.9/13.8	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	Medium	Tourists/Vacationers, Local Residents Clayhead Trail State Scenic District; Clay Head Preserve	High	Clayhead Trail State Scenic District; popular destination for residents and tourists who enjoy sightseeing and recreating.	High
BI13	North Light	SCA	East	27.5	Backlit	VTL4	17.2/15.0	160	Landscape has compatible residential and recreational development; seascape appears intact	Moderate	Tourists/Vacationers, Local Residents North Light National Register Historic Property, Beach Plum Neck/North Light State Scenic Area, Corn Neck Road Historic District (NRE)	High	Remote and private scenic/historic experience set among dune landforms and dense dune vegetation.	High
CI01	Cuttyhunk Island	SCA	South to Southwest	151.3	Backlit	VTL5	13.9/12.1	180	Landscape has compatible residential and recreational development; seascape appears intact	High	Local Residents, Tourists/Vacationers Elizabeth Islands State Scenic Area, Buzzards Bay	High	Cuttyhunk is a remote island, which hosts a small number of year-round residents and a large influx of tourists during the summer months.	High
C01	Beavertail Lighthouse	SCA	Southeast to South-Southeast	27.5	Sidelit	VTL1	18.4/15.9	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	Low	Local Residents, Tourists/Vacationers National Register Historic Site, Beavertail Point Scenic Area, Rhode Island Historic District, Beavertail State Park	High	Popular destination for residents and tourists who enjoy sightseeing, recreating, fishing, and sunbathing.	Medium
LI04	Montauk Point State Park	SCA/LCA	East	48.0	Sidelit	VTL1	31.5/27.4	90	Landscape has characteristic historic lighthouse setting with supporting compatible development; BIWF is visible (approximately 17 miles)	Low	Local Residents, Tourists/Vacationers, Fishing Community Montauk Point State Park, National Register Historic Site, Scenic Area of Statewide Significance	High	Montauk Point Scenic Area of Statewide Significance; Montauk State Park is a popular destination for local residents and tourists/vacationers. Year-round outdoor recreational opportunities include wildlife viewing and photography.	Medium
LI04	Montauk Point State Park - Night	SCA/LCA	East	48.0	N/A	VTL2	31.5/27.4	40	Night seascape influenced by existing BIWF lighting	Medium	Local Residents, Tourists/Vacationers, Fishing Community Montauk Point State Park, National Register Historic Site, Scenic Area of Statewide Significance	High	Montauk Point Scenic Area of Statewide Significance; Montauk State Park is a popular destination for local residents and tourists/vacationers. Year-round outdoor recreational opportunities include wildlife viewing and photography.	High

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Lighting Angle of Proposed Action Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLVIA Sensitivity Rating Rationale	SLVIA Sensitivity Rating (high, medium, low)
MM01	Gooseberry Island	LCA	South to South-Southwest	16.0	Backlit	VTL4	15.1/13.2	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Horseneck Beach State Reservation, Westport South Dartmouth Unit State Scenic Area, Buzzards Bay	Medium	Buzzards Bay is near Gooseberry Public Beach, south of Horseneck Beach State Reservation on the mainland, and within the Westport South Dartmouth State Scenic Area.	Medium
MM04	Nobska Lighthouse	SCA/LCA	South-Southwest to Southwest	53.7	Sidelit	VTL1	28.2/24.5	90	Landscape has characteristic historic lighthouse setting with supporting compatible development; seascape appears intact	Low	Local Residents, Tourists/Vacationers Nobska Lighthouse National Register Historic Site, Church Street/Nobska Point State Historic District, Nobska Beach Association Beach	High	Maintenance of views from historic landmark and scenic area; user groups	Medium
MV02	Philbin Beach	SCA	South-Southwest to West-Southwest	10.5	Variable	VTL5	13.6/11.8	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head West Tisbury Unit State Scenic Area, Philbin Beach	High	A popular destination for residents and tourists who enjoy sightseeing, surfing, swimming, recreating, and sunbathing.	High
MV03	Lucy Vincent Beach	SCA	South-Southwest to Southwest	27.7	Backlit	VTL 3	15.5/13.5	90	Landscape has compatible residential and recreational development; seascape appears intact though occupied by beach users	Medium	Local Residents, Tourists/Vacationers Gay Head West Tisbury Unit State Scenic Area, Lucy Vincent Beach	High	Provides recreational opportunities for town residents including swimming, sunbathing, walking, nature viewing, fishing, and photography.	High
MV03	Lucy Vincent Beach - Sunset	SCA	South-Southwest to Southwest	27.7	Backlit	VTL 4	15.5/13.6	90	Landscape has compatible residential and recreational development; seascape appears intact with minimal influence of beach users	High	Local Residents, Tourists/Vacationers Gay Head West Tisbury Unit State Scenic Area, Lucy Vincent Beach	Medium	Provides recreational opportunities for town residents including walking, nature viewing, and photography. Evening / night less occupied	Medium
MV05	Moshup Beach	SCA	South-Southwest to West-Southwest	23.1	Variable	VTL 5	13.7/11.9	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head West Tisbury State Scenic Area, Moshup Beach	High	Popular public beach; open to residents and tourists and is a popular destination in the summertime.	High
MV05	Moshup Beach - Sunset	SCA	South-Southwest to West-Southwest	23.1	Backlit	VTL 5	13.7/11.10	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head West Tisbury State Scenic Area, Moshup Beach	High	Popular public beach; open to residents and tourists and is a popular destination in the summertime.	High
MV07	Aquinnah Overlook	SCA	South to Southwest	145.5	Sidelit	VTL 3	13.7/11.9	180	Landscape has compatible recreational development; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head Aquinnah Shops Area State Historic Area, Gay Head West Tisbury Unit State Scenic Area, Gay Head Cliffs National Natural Landmark	High	The Aquinnah Overlook is a dedicated viewing platform, providing opportunities for sweeping views of the ocean, beach, shoreline bluffs, and natural vegetation.	High

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Lighting Angle of Proposed Action Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLVIA Sensitivity Rating Rationale	SLVIA Sensitivity Rating (high, medium, low)
MV07	Aquinnah Overlook - Sunset	SCA	South to Southwest	145.5	Backlit	VTL 5	13.7/11.10	180	Landscape has compatible recreational development; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head Aquinnah Shops Area State Historic Area, Gay Head West Tisbury Unit State Scenic Area, Gay Head Cliffs National Natural Landmark	High	The Aquinnah Overlook is a dedicated viewing platform, providing opportunities for sweeping views of the ocean, beach, and shoreline bluffs.	High
MV07	Aquinnah Overlook - Night	SCA	South to Southwest	145.5	N/A	VTL 3	13.7/11.11	180	Night seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head Aquinnah Shops Area State Historic Area, Gay Head West Tisbury Unit State Scenic Area, Gay Head Cliffs National Natural Landmark	High	The Aquinnah Overlook is a dedicated viewing platform, providing opportunities for sweeping views of the ocean.	High
MV09	Gay Head Lighthouse	SCA	South to West-Southwest	162.1	Sidelit	VTL 4	13.9/12.1	180	Landscape has characteristic historic lighthouse setting with supporting compatible development; seascape appears intact	High	Local Residents, Tourists/Vacationers Gay Head Lighthouse National Historic Landmark, Gay Head West Tisbury Unit State Scenic Area	High	Gay Head Lighthouse is a popular destination for residents and tourists interested in historic lighthouses and picturesque ocean views.	High
MV10	South Beach State Park	SCA	Southwest to West-Southwest	17.0	Sidelit	VTL3	22.0/19.1	160	Landscape is characteristic of intact natural shoreline; seascape appears intact other than single buoy on horizon	Moderate	Local Residents, Tourists/Vacationers South Beach State Park	High	The beach is a popular destination for local residents as well as tourists/vacationers, and is heavily utilized during the summer months for recreating, sunbathing, and surfing.	High
MV11	Wasque Point	SCA	West-Southwest	13.6	Backlit	VTL 2	24.8/21.5	140	Landscape is characteristic of intact natural shoreline; seascape appears intact	Low	Local Residents, Tourists/Vacationers Wasque Point	Medium	A variety of public lands used by residents and tourists/vacationers for hiking, sunbathing, beachcombing, and wildlife viewing.	Low
MV12	Peaked Hill Reservation	LCA	South-Southwest to Southwest	305.1	Backlit	VTL 1	16.3/14.2	180	Landscape is characteristic of intact, natural forested shoreline; seascape appears intact	Low	Local Residents, Tourists/Vacationers Identified by the Wampanoag of Gay Head	High	Location has particular cultural importance and is a popular destination for members of the Aquinnah Tribe of Gay Head.	High
MV12	Peaked Hill Reservation - Sunset	LCA	South-Southwest to Southwest	305.1	Backlit	VTL4	16.3/14.2	180	Landscape is characteristic of intact, natural densely forested shoreline; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Identified by the Wampanoag of Gay Head	High	Location has particular cultural importance and is a popular destination for members of the Aquinnah Tribe of Gay Head	High
MV13	Edwin DeVries Vanderhoop Homestead	SCA	South to Southwest	17.0	Backlit	VTL5	13.8/12.0	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	High	Local Residents, Tourists/Vacationers Edwin D. Vanderhoop Homestead National Register Historic Site, Head West Tisbury Unit State Scenic Resource	High	Large numbers of residents and tourists during the summer months while visiting the Aquinnah Cultural Center	Medium

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Lighting Angle of Proposed Action Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLVIA Sensitivity Rating Rationale	SLVIA Sensitivity Rating (high, medium, low)
NI10	Madaket Beach	SCA	West	20.6	Backlit	VTL1	34.6/30.0	60	Landscape has compatible recreational development; seascape appears intact	Low	Local Residents, Tourists/Vacationers Madaket Beach, Nantucket National Historic Landmark	High	Beach is a popular destination for residents and tourists who enjoy sightseeing, recreating, and sunbathing.	Medium
NL01	Nomans Land Island NWR *(not occupied)*	SCA	West-Southwest	42.1	Sidelit	VTL5	8.7/7.5	180	Landscape is characteristic of intact natural shoreline/ bluffs; seascape appears intact; minimal human influence	Medium	No Access Nomans Land Island National Wildlife Refuge/ natural and intact	Low	Uninhabited island with intact seascape	Low
NL01	Nomans Land Island NWR - Sunset *(not occupied)*	SCA	West-Southwest	42.1	Backlit	VTL6	8.7/7.6	180	Landscape is characteristic of intact natural shoreline/ bluffs; seascape appears intact	High	No Access Nomans Land Island National Wildlife Refuge	Medium	Uninhabited island with intact seascape	Medium
RI01	Watch Hill Lighthouse	SCA/LCA	East-Southeast	24.1	Sidelit	VTL1	32.8/28.5	160	Landscape has compatible residential and recreational development; seascape appears intact	Low	Local Residents, Tourists/Vacationers Watch Hill National Register Historic District, Watch Hill State Scenic Area	High	Popular destination for residents and tourists who enjoy sightseeing, history, and recreating.	Medium
RI06	Trustom Pond NWR	SCA/LCA	Southeast	13.8	Backlit	VTL3	22.6/19.6	180	Landscape is characteristic of intact natural shoreline; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Trustom Pond/Matunuck State Scenic Area, Trustom Pond National Wildlife Refuge	Medium	Near the Trustom Pond/Matunuck State Scenic Area, and the Trustom Pond National Wildlife Refuge Public Beach.	Medium
RI08	Scarborough Beach State Park	SCA	Southeast	14.8	Backlit	VTL4	19.1/16.6	180	Landscape is characteristic of recreational shoreline development; seascape appears intact	Medium	Local Residents, Tourists/Vacationers Scarborough State Beach	Medium	Popular destination for residents and tourists who enjoy sightseeing, recreating, and sunbathing.	Medium
RI09	Narragansett Beach	SCA	Southeast	10.5	Backlit	VTL1	20.0/17.4	160	Landscape has compatible residential and recreational development; seascape appears intact	Low	Local Residents, Tourists/Vacationers Narragansett Town Beach	High	Very popular vacation destination and hosts large tourist crowds in the summer with up to 10,000 guests per day.	Medium

Table G-40b. Visual Impact Assessment Impact Matrix for Alternative B (Proposed Action)

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
AI01	Visibility of the entire RWF extends inland across public open space and into the adjacent Newport Country Club before breaking up into discrete areas of visibility of less than half of the WTGs due to screening provided by vegetation, structures, and topography.	Small	Number of turbines visible - 100 Percent visibility - 26%–50%	Medium	Long-term (30 years)/Reversible	Fair	Overall size and scale along with visibility reduces contrast and perceivability	Medium	Importance of recreation and historic resources, duration and visibility from KOP	Moderate

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
AI01	The addition of the flashing warning lights on the WTGs and decks will add evidence of human development and increase visual clutter at the horizon.	Medium	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Large	Long-term (30 years)/Reversible	Fair	Prominence and dominance of warning lights in non-developed setting	Large	The addition of aviation warning lights along the horizon within the viewshed would detract from the overall nighttime environment.	Major
AI03	Project will not be conspicuous to casual observers from this KOP, and the unique rock features in the foreground will remain the focal point in this view.	Medium	Majority of turbines visible - 100 Percent visibility - 51%–75%	Medium	Long-term (30 years)/Reversible	Fair	Overall size and scale along with visibility reduces contrast and perceivability	Medium	Importance of recreation and historic resources; proximity of residential viewers, duration, and visibility from KOP	Moderate
AI05	Project will be prominent in dramatic 180-degree open views and appears wild and undisturbed with open view of the ocean framed by boulders in the foreground.	Large	Number of turbines visible - 100 Percent visibility - 26%–50%	Medium	Long-term (30 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of natural landscape and natural recreation opportunities, scenic values in a preserved seascape; prominence of turbines	Major
AI06	Turbines, are noticeable but are not spatially dominant.	Medium	Number of turbines visible - 99 Percent visibility - 51%–75%	Medium	Long-term (30 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Medium	Importance of recreation along intact shoreline; turbines will be visible along horizon, although will not be a dominant feature in the seascape	Moderate
AI07	Existing foreground built features attract attention initially, although turbines across the horizon become a dominant focal point of the view.	Large	Number of turbines visible - 100 Percent visibility - 2%–25%	Medium	Long-term (30 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of natural landscape and natural recreation opportunities, scenic values associated with byway; prominence of turbines	Major
BI04	Highly visible and likely to attract the attention of lighthouse visitors based on lighting conditions, although not as prominent as the existing BIWF.	Medium	Majority of turbines visible - 97 Percent visibility - 26%–50%	Medium	Long-term (30 years)/Reversible	Fair	Visibility based on lighting conditions, existing BIWF visibility, duration	Medium	Importance of recreation and historic resources, duration and visibility from KOP based on lighting conditions	Moderate
BI04	The addition of the flashing warning lights on the WTGs and decks will add evidence of human development and increase visual clutter at the horizon.	Large	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Large	Long-term (30 years)/Reversible	Fair	Visibility based on lighting conditions, existing BIWF visibility, duration	Large	Importance of recreation and historic resources, duration and visibility from KOP based on lighting conditions	Major

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
BI12	Visible and likely to attract attention resulting from angle of view of WTGs	Medium	Number of turbines visible - 100 Percent visibility - 51%–75%	Medium	Long-term (30 years)/Reversible	Fair	Visibility of WTGs within viewshed along horizon line within viewshed	Medium	Importance of preservation of scenic district and uses; proximity and visibility of Project	Moderate
BI13	Turbines become the focus of views out to the water and the tight spacing and numerous turbines along the horizon draw the viewers' eye away from natural features.	Large	Number of turbines - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of recreation and historic resources; proximity of residential viewers, duration and visibility from KOP	Moderate
CI01	Turbines and OSS facilities would begin to dominate the horizon and are uncharacteristic of existing conditions.	Large	Number of turbines visible - 99 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Prominence and dominance of turbines in non-developed setting	Large	Importance of recreation and historic resources; size, scale, and visibility from KOP	Major
C01	Turbines are perceivable along horizon line, although the degree of change from existing condition would be minor.	Small	Number of turbines visible - 100 Percent visibility - 51%–75%	Medium	Long term (35 years)/Reversible	Fair	Overall size and scale along with visibility reduces contrast and perceivability	Small	Importance of recreation and historic resources; size, scale and visibility from KOP	Minor
LI04	Due to distance and viewer position in relation to other features in the landscape, there would be minor change in the existing condition.	Small	Number of turbines visible - 91 Percent visibility - 51%–75%	Medium	Long term (35 years)/Reversible	Fair	Project would not be perceivable along horizon due to distance and atmospheric influences	Small	Project would not be perceivable along horizon due to distance and atmospheric influences. Occasional blade tips and movement may be noticeable by the focused viewer or backlighting.	Negligible
LI04	Due to distance and viewer position in relation to other features in the landscape, there would be minor change in the existing condition.	Small	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Small	Long term (35 years)/Reversible	Fair	Project would be perceivable along horizon if observer views were focused toward lighting	Small	The addition of aviation warning lights along the horizon within the viewshed would be perceivable by the focused viewer, but not a dominant element as compared to other existing warning lighting sources associated with BIWF that are in closer proximity (approximately 16 miles).	Negligible
MM01	Visible and likely to attract the attention resulting from angle of view of WTGs	Medium	Number of turbines visible - 100 Percent visibility - 76%–100%	Medium	Long term (35 years)/Reversible	Fair	Project blades would be perceivable along horizon	Medium	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	Minor
MM04	Degree of change in existing conditions would be minimal due to distance and existing modifications within the foreground.	Small	Number of turbines visible - 90 Percent visibility - 51%–75%	Medium	Long term (35 years)/Reversible	Fair	Distance to project, natural and human-made features in the foreground would reduce magnitude	Small	Importance of natural landscape and recreation opportunities; distance of turbines in relation to KOP	Minor

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
MV02	Turbines are very visible on the horizon line and will dominate the view from the KOP.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	Moderate
MV03	Visible and likely to attract the attention resulting from angle of view of WTGs	Medium	Number of turbines visible - 59 Percent visibility - 76%–100%	Medium	Long term (35 years)/Reversible	Fair	Visibility of WTGs within viewshed along horizon line within viewshed	Medium	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	Moderate
MV03	WTGs appear dark gray against the light sky and the position of the sun serves as a focal point, drawing the viewer's eye toward part of the proposed Project.	Large	Number of turbines visible - 59 Percent visibility - 76%–100%	Medium	Long term (35 years)/Reversible	Fair	Visibility of backlit WTGs within viewshed along horizon line within viewshed	Large	Scenic values; prominence of turbines- sunset backlighting of turbines along with movement influences prominence	Major
MV05	With the proposed RWF in place, the nacelles and rotors from numerous WTGs and two OSSs will be visible from this KOP in the background along the horizon.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	Moderate
MV05	WTGs appear dark gray against the light sky and the position of the sun serves as a focal point, drawing the viewer's eye toward part of the proposed Project.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Visibility of backlit WTGs within viewshed along horizon line within viewshed	Large	Scenic values; prominence of backlit turbines on the horizon	Major
MV07	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Prominent, dedicated viewpoint	Major
MV07	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Prominent, dedicated viewpoint	Major
MV07	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Prominent, dedicated viewpoint; warning lighting appears low on the horizon	Major

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
MV09	The two OSSs appear as dark elements on the horizon suspended above the water surface. From this superior vantage point, the entirety of the Project is visible.	Large	Number of turbines visible - 70 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of historic lighthouse, scenic values; prominence of turbines and OSSs	Major
MV10	Nacelles and rotors from numerous WTGs will be visible in the background along the horizon. Turbines are visible on the horizon and provide a focal point.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Medium	Importance of natural landscape and natural recreation opportunities; massing of turbines on horizon	Moderate
MV11	Nearest WTG is 24.6 miles (39.6 km) away; the towers are largely obscured due to curvature of the Earth, with their degree of exposure decreasing from left to right.	Medium	Number of turbines visible - 89 Percent visibility - 2%–25%	Moderate	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Medium	Importance of natural landscape and natural recreation opportunities; visibility of WTGs due to distance and percentage of visibility	Minor
MV12	KOP on Peaked Hill represents a discrete view to the southwest that requires the viewer to be perfectly positioned.	Small	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Small Based on simulation graphic all are visible / vegetation and perspective influence	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions, vegetation and viewer perspective	Small	Importance of cultural significance and natural recreation opportunities; visibility of WTGs due to intervening vegetation and landforms	Major
MV12	Sunset illumination and backlighting influences change	Large	Number of turbines visible - Percent visibility - % Information not available in RWF VIA	Large Based on simulation graphic all are visible / vegetation and perspective influence	Long term (35 years)/Reversible	Fair	Backlighting of WTGs, increased visibility	Large	Importance of cultural significance and natural recreation opportunities; visibility of WTGs due to backlighting	Major
MV13	WTGs are visible; light gray towers, nacelles, and rotors are fully visible above the horizon.	Large	Number of turbines visible - 100 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of natural landscape and natural recreation opportunities; visibility of WTGs due to distance and percentage of visibility	Major
NI10	WTGs are barely visible along the horizon, with a small cluster of turbine blades and nacelle comprising the majority of visible features.	Small	Number of turbines visible - 26 Percent visibility - 76%–100%	Small (distance)	Long term (35 years)/Reversible	Fair	Not perceivable at distance.	Small	Importance of natural landscape and natural recreation opportunities; visibility of WTGs due to distance	Minor

KOP Number	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Geographic Extent Rationale (Appendix A COP VIA)	Geographic Extent Rating (large, medium, small)	Duration/Reversibility Rationale	Duration/Reversibility Rating (good, fair, poor)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
NL01	WTGs appear as gray vertical lines against the yellow backdrop of the sky that look out of character with the vast extent of open water.	Large	Number of turbines visible - 100 Precent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Intact seascape and prominence of WTGs in close proximity, although no viewers	Major
NL01	Sunset illumination and backlighting influences change	Large	Number of turbines visible - 100 Precent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Backlighting of WTGs, increased visibility	Large	Intact seascape and prominence of WTGs, although no viewers; backlighting of WTGs and OSS	Major
RI01	WTGs are barely visible from this location due largely to their distance from the viewer and the screening effects of curvature of the Earth.	Small	Number of turbines visible - 89 Percent visibility - 26%–75%	Small (Distance)	Long term (35 years)/Reversible	Fair	Not perceivable at distance.	Small	Importance of historic setting and natural recreation opportunities; visibility of WTGs due to distance	Minor
RI06	Upper portions of the WTGs are perceptible as slender gray protrusions above the horizon line.	Medium	Number of turbines visible - 99 Percent visibility - 2%–25%	Medium	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Medium	Intact seascape and presence of WTGs along horizon	Minor
RI08	Nacelles and rotors of numerous WTGs are visible along the horizon, distance	Medium	Number of turbines visible - 99 Percent visibility - 76%–100%	Large	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Large	Importance of recreation opportunities; visibility of WTGs due to distance and percentage of visibility	Moderate
RI09	WTGs will be visible along the horizon; distance	Medium	Number of turbines visible - 99 Percent visibility - 26%–50%	Medium	Long term (35 years)/Reversible	Fair	Size and scale in relation to existing conditions along with percentage of visibility	Medium	Importance of recreation opportunities; visibility of WTGs due to distance and percentage of visibility	Moderate

Table G-41a. Seascape Landscape Impact Assessment for Alternative B (Proposed Action) - Seascape Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Shoreline Beach	SCA	AI06, MV02, MV10, MV11, NI10, RI08, RI09	Unobstructed, expansive water-level view of the shoreline and across open water	High	Viewer activity in this area is primarily recreational, including swimming, sunbathing, walking, beachcombing, fishing, and surfing. Examples include Watch Hill, Narragansett, Horseneck, and Sachuest Beaches.	High	Iconic eastern shore beach setting with intermixed characteristic built features. Open ocean adjacency.	High	35.3/ 2.4	Small	Prominence of WTGs based on adjacency of open water to character area, with uninterrupted views to horizon and Project.	Large	Long term (35 years)/ Reversible	Fair	Overall visible land area in comparison with prominence of Project and duration of time	Medium	Predominately high sensitivity along with medium degree of magnitude	Moderate
Coastal Bluff	SCA	BI04, BI12, C01, MV07, MV13, NL01	Elevated views; Because of elevation and lack of tall vegetation, these views typically include significant lengths of shoreline and a broad expanse of open ocean as well as typical inland features. Views are generally only available from discrete public access points and trails.	Medium	Discrete, elevated views along visually variable landscape. Includes the south shore of Block Island including the Clayhead Trail in New Shoreham, at Gay Head in Aquinnah on Martha's Vineyard, along portions of the Cliff Walk in Newport, and at Montauk Point on Long Island.	High	Iconic eastern shore cliff and bluff setting with open ocean adjacency.	High	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Developed Waterfront	SCA	N/A	Dominance of human-made features including docks, boats, and shoreline buildings/structures	Low	Fishing ports, harbors, marinas, and shoreline commercial and industrial areas	Medium	Activity in these areas is generally water-oriented but highly variable and includes commercial fishing, seafood processing, boat repair, pleasure boating, retail shopping, and restaurants.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Shoreline Residential	SCA	AI03, RI01	Shoreline homes are specifically situated to take advantage of water views.	High	Year-round and seasonal homes situated along the ocean shoreline. The defining characteristic of this zone is a broad, often elevated, view of the ocean from a residential setting.	High	Home are positioned and occupied for the appeal of iconic oceanside views.	High	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Coastal Dunes	SCA	BI13, MV03, MV05	Views from the dunes are largely restricted to these paths and typically screened by the tight, rolling landform until	Medium	Coastal dunes are typically strictly regulated ecological communities, and access is limited to narrow,	Medium	Viewer activity in this area is almost exclusively recreational and typically focused on sightseeing	Medium	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
			emerging at the top of the beach.		enclosed footpaths and boardwalks that cut through or over the dunes, providing public access to the beaches.		and beach access.											

Table G-41b. Seascape Landscape Impact Assessment for Alternative B (Proposed Action) - Seascape Character Areas and Landscape Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Salt Pond/ Tidal Marsh	SCA/LCA	RI06	Views are available across the open water but are generally interrupted by adjacent dunes, barrier spits, and/or scrub vegetation that separates the ponds and the adjacent land from the ocean.	Low	Residences often occur along the edges of these ponds, as indicated by docks and boats along their shorelines. Recreational activity in the form of boating, fishing, and clamming is common in these areas.	Medium	Multi-use setting with localized views, increased distance from the open ocean.	Medium	35.3/ 2.4	Small	Intermix of vegetation, topography, and viewer position in relation to Project begins to influence the degree to which Project is perceived.	Medium	Long term (35 years)/ Reversible	Fair	Overall visible land area in comparison with prominence of Project and duration of time	Medium	Combination of high, medium, and low sensitivity (combined for and overall medium) along with medium degree of magnitude	Moderate
Inland Lakes and Ponds	SCA/ LCA	N/A	The dominant visual feature of this zone is an open expanse of flat water that is enclosed by a	Low	Given their locations and surrounding screening, views to the ocean are relatively rare.	Low	Views are constrained within immediate area with ocean views	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
			vegetated shoreline. Occasionally interrupted by human-made features, such as homes and boat launches		Human activity on the lakes and along the shoreline includes boating, fishing, and swimming.		obscured by vegetation.											
Maintained Recreation Area	SCA/LCA	AI01, AI03, BI04, C01, LI04, MM04, MV09, RI01	Views of the ocean are highly variable, depending on the proximity to the shoreline. The open, maintained landscape generally allows for expansive, unobstructed views of the surrounding seascape.	High	Recreation focused with open lawns at public parks, lighthouses, USCG stations, and golf courses. Lighthouses and state parks are often associated.	High	Iconic settings, with lighthouses, open ocean views with a recreation focus	High	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Highway Transportation	SCA/LCA	N/A	High-volume vehicular travel corridors that traverse the landscape and are dominated by automobiles. Travel is at moderate to high speed, and outward peripheral views are fleeting.	Low	Dominated by adjacent buildings/structures and trees with limited elevated long-distance views available.	Medium	Viewer focus is associated with driving activity and with limited duration views.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Table G-41c. Seascape Landscape Impact Assessment for Alternative B (Proposed Action) - Landscape Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Coastal Scrub/ Shrub Forest	LCA	AI05, AI07, CI01, MM01,	Outward views are largely enclosed by surrounding vegetation and are limited to the orientation and width of the cleared corridor.	Low	Viewer activity is primarily local travel and recreational trail use.	Medium	Views are constrained within the immediate area with ocean views obscured by vegetation.	Low	35.3/ 2.4	Small	As distance from Project increases, the degree to which Project is noticeable decreases due to the influence of the built and naturally vegetated environment associated with these character areas.	Medium/ Small	Long term (35 years)/ Reversible	Fair	Overall visible land area in comparison with prominence of Project and duration of time	Medium	Overall low sensitivity with medium degree of magnitude	Minor
Agricultural/ Open Field	LCA	N/A	Open farmland provides for long-distance views in this zone; adjacent forest, coastal scrub, and buildings/structures typically frame/enclose these views and provide significant screening.	Low	Occurs primarily inland of the coast, views to the ocean are relatively rare.	Low	Setting is not influenced by views of the ocean, and pastoral/agricultural character dominates.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Character Area Name	Character Area Association (SCA/LCA/ OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Forest	LCA	MV12	Long-distance views within the zone are generally either fully or partially screened by vegetation and, when present, are tightly enclosed by the surrounding trees.	Low	Variable vegetation characteristics in relation to typical ocean, seascape environment provides more enclosed setting for users.	Low	Views are constrained within the immediate area with ocean views obscured by vegetation.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Rural Residential	LCA	N/A	Rural residences tend to be located along narrow, tree-lined roads, with intervening vegetation. Long-distance views are largely restricted to small open fields.	Low	Typical viewer activity includes residential activity, outdoor recreation, and local travel.	Low	Views are constrained within the immediate area with ocean views obscured by vegetation.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Suburban Residential	LCA	N/A	Medium to high-density residential neighborhoods that typically occur on the outskirts of villages and town centers and along secondary roads and cul-de-sacs spurring off	Low	Views are generally limited by the surrounding forest vegetation, adjacent buildings/structures, and/or undulating topography that surrounds the subdivisions.	Low	Localized views and influence of built residential environment	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Character Area Name	Character Area Association (SCA/LCA/ OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Land Acres within Analysis Area: 1,488.1 Square Miles	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
			the main roads.															
Village/ Town Center	LCA	N/A	Moderate to high-density residential and commercial development includes larger town center areas. Buildings (typically two- to three-stories tall) and other human-made features dominate the landscape.	Low	Outward views that are available will typically exist in areas on the outskirts of the villages and town centers and will generally be partially screened by existing buildings/structures and surrounding native vegetation.	Low	Localized views and influence of built environment	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.
Commercial	LCA	N/A	Commercial development along a highway includes retail businesses, restaurants, convenience stores, automobile dealers, shopping centers, and malls.	Low	Views are focused along the axis of the highway and the foreground is dominated by buildings, automobiles, paved roads, and parking lots.	Low	Urbanized built environment dominates and is the primary focus.	Low	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.	Same as above.

Table G-41d. Seascape Landscape Impact Assessment for Alternative B (Proposed Action) - Ocean Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) *Alternative B - Proposed Action* *Total OCA area within Analysis Area: 6,113.4 Square Miles*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and Scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Open Ocean	OCA	N/A	Presence of open water as a dominant foreground element in all directions. Human-made features in the water are limited but may include occasional jetties, buoys, and boats.	High	Human activity on the water can be extensive, especially near major ports and navigation,	High	Presence of open ocean environment with unobstructed horizon is of high importance to users and visitors.	High	5,882.2 / 96.2 Maximum ocean visibility as compared to all alternatives	Large	Predominantly intact open ocean within immediate proximity of WTGs and OSS facilities not characteristic of the OCA	Large	Long term (35 years)/ Reversible	Fair	Proximity of OCA to Project with uninterrupted ocean views surrounding Project for duration of Project. Approximately 96% of OCA total acres with visibility.	Large	Intact open ocean setting, in immediate proximity of Project components for the duration of Project.	Major

Table G-41e. Seascape Landscape Impact Assessment for Alternative B (Proposed Action) - Specially Designated Areas

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Specially Designated Area with Visibility of Alternative (Acres/Percentage) *Proposed Action (Alternative B)*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Historic Sites and National Landmarks	12,308.0	AI01, AI03, BI04, BI12, BI13, C01, C02, BI13, MM04, MV07, MV09, MV13, RI01	161 districts and individual properties listed or eligible for the NRHP and 13 properties or districts listed as National Historic Landmarks (NHL). These include historic districts, homes, lighthouses, churches, and government buildings.	High	Properties have historic, regional and national significance.	High	Historic properties and sites generally have high than average sensitivity based on the nature of the property and its relationship to the setting.	High	1,222.08 / 9.9	Medium	General proximity of project in relation to sensitive resource and experiences associated with historic/ culturally significant locations.	Large	Long term (35 years)/ Reversible	Fair	General proximity of project in relation to sensitive resource and experiences associated with historic/ culturally significant locations.	Large	Importance of iconic sites, settings and experiences associated with locations in contrast to introduction of project.	Major

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Specially Designated Area with Visibility of Alternative (Acres/Percentage) *Proposed Action (Alternative B)*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
National Natural Landmarks	349.7	MV07	Sites that contain outstanding biological and geological resources and encourages the conservation of these areas.	Medium	Two locations identified within analysis area. Primary importance is related to physical resources, with lesser potential importance on experiences.	Medium	Preservation of physical resources associated with landmarks.	Medium	255.5 / 73.1	Large	Proximity of Gay Head Cliffs is approximate 14-miles from project. Muskeget Island is approximately 31.6 miles.	Medium	Long term (35 years)/ Reversible	Fair	Variable distances of resource from project.	Large	two identified localized resources with variable proximity to project and localized focus on physical resources.	Moderate
State Scenic Areas	105,777.6	BI12, CI01, MV07	93 state-designated scenic areas, including 56 in Rhode Island; 34 in Massachusetts; 3 in New York	High	Importance of iconic landscapes (ex. Martha's Vineyard) that surround the lease area.	High	Often associated with iconic settings and places which most often have regional and national significance related to sense of place.	High	18,205.6 / 17.2	Small	Overall percentage of visible areas and distribution of locations often in relative proximity to project.	Large	Long term (35 years)/ Reversible	Fair	Variability of visibility in relation to resource with approximately 1/4 of acres having visibility of project.	Medium	Overall higher sensitivity to change based on nature of resource and iconic landscapes.	Major
National Wildlife Refuges	15,176.1	AI05, NL01, RI06	System of public lands and waters set aside to conserve the nation’s fish, wildlife, and plants. Nine refuges occur within the analysis area.	Low	Preservation of natural resources specific to refuge.	Low	Preservation of physical resources associated with refuges.	Medium	767.7 / 5.1	Small	Percentage of visibility of project in relation to distributed areas and refuge locations	Small	Long term (35 years)/ Reversible	Fair	Minimal to no change to physical resource visually.	Small	Refuges are focused on the preservation of natural resources, with closest refuge not occupied by humans.	Minor
State/Non-Profit Wildlife Management Areas	31,967.8	AI07	18 State Wildlife Management Areas: nine in Rhode Island and nine in Massachusetts. Lands are managed to provide wildlife habitat and accommodate wildlife-related recreation (hunting, bird watching, etc.).	Low	Preservation of natural resources specific to management areas.	Low	Preservation of physical resources associated with management area. Variable uses and activities.	Medium	1,31.4 / .4	Small	Small percentage of project visibility.	Small	Long term (35 years)/ Reversible	Fair	Minimal to no change to physical resource visually.	Small	Management areas are focused on the preservation of natural resources and providing recreation resources.	Minor
National Parks	31.2	N/A	New Bedford Whaling National Historical Park,	Low	Associated with historical maritime activities,	Low	Higher sensitivity as a result of	Medium	.2 / .7	Small	Overall distance from project is approximately	Small	Long term (35 years)/ Reversible	Fair	No perceivable change	Small	Importance as a National Park, though physically	Negligible

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Specially Designated Area with Visibility of Alternative (Acres/Percentage) *Proposed Action (Alternative B)*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
			New Bedford, Massachusetts. Approximately 26-miles from project.		localized interest.		National Park designation				26 miles with one WTG visible.				related to project		distanced from project to have negligible impacts or visibility.	
State Parks	10,473.8	AI01, LI04, MV10, RI08	17 State parks and reservations that occur within the analysis area and provide recreation and sight-seeing opportunities.	Medium	Variable recreation sites and opportunities for local and national interests.	Medium	Importance of recreation destinations and associated ocean viewing opportunities.	High	2,731.7 / 26.1	Medium	Over 1/4 of area with visibility and proximity of project.	Medium	Long term (35 years)/ Reversible	Fair	Physical presence of project 16-miles to 30+ miles; with variable visibility.	Medium	Recreation and ocean focused recreation with multiple user groups and interests.	Moderate
State Nature and Historic Preserves	248.4	N/A	John H. Chafee State Nature Preserve. Open to the public and provides agricultural, educational, and scenic values, as well as natural and historical resources	Low	Preservation of local heritage and resources.	Low	Preservation of heritage resources of the region.	Medium	3.1 / 1.2	Small	Resource is approximately 24-miles from nearest WTG with minimal visibility.	Low	Long term (35 years)/ Reversible	Fair	Physical distance from project and overall visibility.	Low	Localized interests with preservation focus, limited to no visibility of project.	Negligible
State Forests	5,301.6	N/A	Manuel F. Correllus State Forest, located on the inland portion of Martha's Vineyard, Massachusetts, is the only state forest. Inland forest with vegetation and topography.	Low	Located in the center of Martha's Vineyard, multi-use recreation activities.	Low	Large local recreation resource with internally focused activities, surrounded by urban development.	Low	7.8 / .2	Small	Inland recreation resource with limited visibility of project.	Low	Long term (35 years)/ Reversible	Fair	Inland location with intervening influence of vegetation, topography and built environment.	Low	Localized recreation resource, surrounded by urban development with intervening features that limit project visibility.	Negligible
State Beaches	165.1	N/A	Nine state beaches; heavily used bathing beaches that typically include large parking areas, bathhouses, pavilions, and concession buildings.	Medium	Recreation destination for high number of users with focus of activities towards ocean environment.	High	Iconic eastern shore beach destinations with high user interest.	High	78.2/ 47.4	Medium	Approximately 1/2 of beach areas with visibility of project beyond 20-miles.	Medium	Long term (35 years)/ Reversible	Fair	Beach locations are at or beyond 20-miles from project where scale decreases but project is perceivable.	Medium	Popular beach destinations with viewer focus toward ocean and beach activities. Overall distance from project is approximately 20-miles.	Moderate

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Specially Designated Area with Visibility of Alternative (Acres/Percentage) *Proposed Action (Alternative B)*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
Highways Designated or Eligible as Scenic	411.6	N/A	Two scenic byways are located within Rhode Island with waterfront, shoreline and coastline views.	Medium	Scenic Byway designation indicates value and importance of resources associated.	High	Protection of designation and associated iconic views.	High	43.4 / 10.5	Small	Overall low percentage of visibility in relation to linear resource.	Low	Long term (35 years)/ Reversible	Fair	Low to intermittent visibility and associated intervening features.	Medium	Importance of scenic byway designation and preservation of resource with intermittent and variable viewing conditions from motorists.	Moderate
National Historic Trails	990.1	N/A	Washington-Rochambeau Revolutionary Route - national resource with period significance related to setting.	High	Congressionally designated trail resource with historic significance.	High	Changes in visual setting related to the trail.	High	.8 / .1	Small	Small percentage of visibility related to resource.	Low	Long term (35 years)/ Reversible	Fair	Low visibility with intermix of urban and natural features with WTG distance ranging from 18 to 40-miles.	Low	National Trail designation significance (high sensitivity) with low visibility of project.	Minor
National Recreation Trails	88.6	AI03	Cliff Walk within Ochre Point Cliffs Historic District with iconic setting and views.	High	Views of the Atlantic Ocean historic mansions, wildflowers, wildlife, and shorelines.	Medium	Iconic setting with interests associated with preservation of resource and views.	High	65.1 / 73.4	Large	Large percentage of resource has visibility of project.	High	Long term (35 years)/ Reversible	Fair	Visibility of project in relation to resource within approximately 15-miles.	High	Importance of resources in relation to setting and natural environment with a large portion of the trail having visibility of project.	Major
State Fishing and Boating Access Sites	371.4	N/A	45 state-owned and/or -managed fishing and boating access sites with focus on maritime or ocean related activities.	Low	Recreational focus with inter-related views of ocean and setting.	Low	Primary focus of resources is related to recreation activities in interrelated ocean setting.	Medium	78.4 / 21.1	Medium	Approximately 1/4 of acres with visibility of project and are at least 16-miles from lease area.	Low	Long term (35 years)/ Reversible	Fair	Resources in relation to project and visibility.	Medium	Recreation resource with interrelated interest in ocean setting and views, variable distances from project beyond 16-miles.	Moderate
Lighthouses	23.0	BI04, C01, MM04, MV09, RI01	32 lighthouses; with proximity to ocean edge based on nature of resource and setting.	High	Lighthouses are characteristically associated with shoreline areas and settings with ocean focus.	High	Visitors and users of lighthouse resources as destination and iconic setting.	High	6.6 / 28.7	Medium	One lighthouse within approximately 9-miles of project. All others are associated with ocean	High	Long term (35 years)/ Reversible	Fair	Proximity of lighthouses in relation to project influences potential visibility and prominence.	High	Nature of lighthouses in relation to iconic ocean setting and proximity of project.	Major

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Susceptibility Rationale	Susceptibility Rating (high, medium, low)	Value Rationale	Value Rating (high, medium, low)	SLIA Sensitivity Rating Rationale	SLIA Sensitivity Rating (high, medium, low)	Geographic Extent of Specially Designated Area with Visibility of Alternative (Acres/Percentage) *Proposed Action (Alternative B)*	Geographic Extent Rating (large, medium, small)	Size or Scale Rating Rationale (degree of change from existing conditions)	Size and scale Rating (large, medium, small)	Duration/ Reversibility Rationale	Duration/ Reversibility Rating (good, fair, poor)	SLIA Magnitude Rating Rationale	SLIA Magnitude Rating (large, medium, small)	SLIA Overall Impact Level Rationale	SLIA Overall Impact Level (major, moderate, minor, negligible)
											proximity that orients them closer to project.							
Public Beaches	4,221.0	AI06, MM01, MV02, MV03, MV05, MV11, NI10, RI09	178 public beaches with recreation focus and ocean facing views, iconic settings	Medium	Iconic recreation destination for high number of users with focus towards ocean and beach activities.	Medium	Typically higher interests in ocean setting with variable activities and user focus.	Medium	11,38.8 / 27.0	Medium	Approximately 1/4 of acres with visibility of project. Viewer position along beaches is often inline with project.	Medium	Long term (35 years)/ Reversible	Fair	Closest beach is approximately 13-miles; variable viewer perspectives and positioning.	Medium	Iconic beach setting with high user interest and activity though viewer position and visibility of project can be variable.	Moderate
Ferry Routes	10,641.7	N/A	20 different ferry routes originating from multiple locations around project. Proximity of routes to project.	Medium	Dedicated ocean focused uses used for either pleasure or utility purposes.	Medium	Variability in users and interests intermixed with other seagoing vessels.	Medium	6,365.0 / 59.8	Large	Over 1.2 of ferry routes with visibility due to open ocean environment.	High	Long term (35 years)/ Reversible	Fair	Resource is ocean based and in closer proximity to project, though duration of view can be short-term and directional.	High	Variability in viewer interest and overall sensitivity within dedicated ferry lanes. Proximity of project in relation to routes influences prominence based on duration and direction.	Moderate
Seaports	90.1	N/A	Five seaports associated with working waterfront activity	Low	Industrial and seagoing areas with associated infrastructure.	Low	Variable users and interests; with primary focus related to industry.	Low	2.3 / 2.5	Small	Overall low visibility and perception of project due to intermix of other built features and distance.	Low	Long term (35 years)/ Reversible	Fair	Perceivability of project in relation to other seaport uses and activities.	Low	Primary focus of seaports related to industrial and commercial uses with surrounding infrastructure and built environment.	Negligible
Other State Land with Public Access	9,361.8	N/A	Variability of other resources associated with natural resources, recreation activities and locally sensitive uses.	Medium	Variability of uses and interests.	Medium	Variable users and interests	Medium	325.3 / 3.5	Small	Overall small percentage of visibility in relation to total acres.	Low	Long term (35 years)/ Reversible	Fair	Variability of locations, which based on visibility can be assumed to be inland focused.	Low	High variability in use, interest and sensitivity; low overall visibility as compared to total acres.	Negligible

Table G-42. Visual Impact Assessment Impacts Matrix for Alternative C (Habitat Alternative)

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative C1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative C1	Distance to Nearest Turbine (miles/nautical miles) Alternative C2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative C2	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
CI01	Cuttyhunk Island	High	13.9/12.1	13.9/12.1	17.8/15.5	13.9/12.1	17.8/15.5	C2	The reduction of WTGs in close proximity of the KOP would not decrease visibility of the WTGs. WTG reduction would be localized to the center view of the KOP, where turbines are removed surrounding the eastern most OSS. The lease area would appear to have two separate WTG areas.	Major
MM01	Gooseberry Island	Medium	15.2/13.2	15.2/13.2	22.4/19.5	15.2/13.2	22.3/19.4	C1 and C2	The reduction of WTGs associated with each Alternative would not decrease visibility of the WTGs within 20-miles of the KOP. WTG reduction would be localized to areas beyond 20-miles and would remove turbines that have WTG blades visible along the horizon.	Minor
MV02	Philbin Beach	High	13.6/11.8	13.8/12.0	13.6/11.8	13.8/12.0	13.6/11.8	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Moderate
MV05	Moshup Beach	High	13.8/12.0	13.7/11.9	13.7/11.9	13.7/11.9	13.7/11.9	C1 and C2	Alternative C1 and C2 would have similar impacts. The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Major
MV05	Moshup Beach - Sunset	High	13.8/12.1	13.7/11.9	13.7/11.9	13.7/11.9	13.7/11.9	C1 and C2	Alternative C1 and C2 would have similar impacts. The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP. The backlighting resulting from sunset conditions would enhance the distinctiveness of the break in continuity of the WTG massing.	Major
MV07	Aquinnah Overlook	High	13.7/12.0	13.7/12.0	14.0/12.1	13.7/12.0	14.0/12.1	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Moderate
MV07	Aquinnah Overlook - Sunset	High	13.7/12.0	13.7/12.0	14.0/12.2	13.7/12.1	14.0/12.2	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP. The backlighting resulting from sunset conditions would enhance the distinctiveness of the break in continuity of the WTG massing.	Major
MV07	Aquinnah Overlook - Night	High	13.7/12.0	13.7/12.0	14.0/12.3	13.7/12.2	14.0/12.3	C2	Alternative C2 would have slightly fewer nighttime impacts with the reduction of 3 WTGs within the center of view. The reduction of WTGs within the center of the lease area would reduce the density of the project within the viewshed at night, though would not decrease visibility of the WTGs left and right of center of the KOP. The Alternative would visually appear as two separate projects based on visible lighting, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP. WTG lighting would be visible right and left of center of the KOP.	Major
MV09	Gay Head Lighthouse	High	13.9/12.1	13.9/12.1	14.1/12.3	13.9/12.1	14.1/12.3	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Moderate

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative C1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative C1	Distance to Nearest Turbine (miles/nautical miles) Alternative C2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative C2	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
MV10	South Beach State Park	High	22.0/19.1	22.0/19.1	25.3/22.0	22.0/19.1	25.3/22.0	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project along the center of the horizon of the viewshed, though would not decrease predominant visibility of the WTGs left of center of the KOP.	Major
MV11	Wasque Point	Low	24.8/21.5	24.8/21.5	28.5/24.8	24.8/21.5	28.5/24.8	C1 and C2	he reduction of WTGs associated with each Alternative within the center of the lease area would reduce the visibility of WTG blades visible along the right of center of KOP along the horizon, though would not decrease visibility of the WTGs center and left of center of the KOP.	Minor
MV12	Peaked Hill Reservation	High	16.3/14.2	16.3/14.2	17.3/15.1	16.3/14.2	17.3/15.1	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Major
MV12	Peaked Hill Reservation - Sunset	High	16.3/14.2	16.3/14.2	17.3/15.1	16.3/14.2	17.3/15.1	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Major
MV13	Edwin DeVries Vanderhoop Homestead	Medium	13.8/12.0	13.8/12.0	14.0/12.1	13.8/12.0	14.0/12.1	C1 and C2	Alternative C1 and C2 would have similar impacts. The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 15-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Moderate
NI10	Madaket Beach	Medium	34.6/30.0	34.6/30.0	39.0/34.0	34.6/30.0	39.7/34.5	C1 and C2	No change from Proposed Action. Views of eastern portion of the lease area from the KOP would be the same as the Proposed Action. A small portion of the turbine blades would be visible on the distance horizon under clear viewing conditions.	Minor
NL01	Nomans Land Island NWR *(not occupied)*	Medium	8.7/7.5	8.7/7.5	9.0/7.8	8.7/7.5	9.0/7.8	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP within 8 to 12-miles. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP.	Moderate
NL01	Nomans Land Island NWR - Sunset *(not occupied)*	Medium	8.7/7.5	8.7/7.5	9.0/7.9	8.7/7.6	9.0/7.9	C1 and C2	The reduction of WTGs associated with each Alternative within the center of the lease area would reduce the density of the project within the viewshed, though would not decrease visibility of the WTGs left and right of center of the KOP. Both alternatives would visually appear as two separate projects, with a slight variation associated with Alternative 1 where 3 WTGs remain in the center of view from the KOP. The backlighting resulting from sunset conditions would enhance the distinctiveness of the break in continuity of the WTG massing.	Major

Table G-43a. Seascape Landscape Impact Assessment for Alternative C (Habitat Alternative) - Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C1 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Shoreline Beach	SCA	AI06, MV02, MV10, MV11, NI10, RI08, RI09	35.3/ 2.4	35.0/ 2.4	34.7/ 2.3	Alternatives C2 would have negligible reduction in visible acres across all SCAs	SCA - Moderate

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C1 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Coastal Bluff	SCA	BI04, BI12, C01, MV07, MV13, NL01				and LCAs as compared to the Proposed Action. The importance of SCAs for recreation and other uses along with residential areas of LCAs in close proximity of SCAs where ocean views dominate or are of high value, influence the overall impact level associated with the project and associated alternatives.	
Developed Waterfront	SCA	N/A					
Shoreline Residential	SCA	AI03, RI01					
Coastal Dunes	SCA	BI13, MV03, MV05					
Salt Pond/ Tidal Marsh	SCA/LCA	RI06					SCA/ LCA -Moderate
Inland Lakes and Ponds	SCA/LCA	N/A					
Maintained Recreation Area	SCA/LCA	AI01, AI03, BI04, C01, LI04, MM04, MV09, RI01					
Highway Transportation	SCA/LCA	N/A					
Coastal Scrub/ Shrub Forest	LCA	AI05 , AI07, CI01, MM01,					LCA - Minor
Agricultural/ Open Field	LCA	N/A					
Forest	LCA	MV12					
Rural Residential	LCA	N/A					
Suburban Residential	LCA	N/A					
Village/ Town Center	LCA	N/A					
Commercial	LCA	N/A					

Table G-43b. Seascape Landscape Impact Assessment for Alternative C (Habitat Alternative) - Ocean Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C1 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative C2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Open Ocean	OCA	N/A	5,882.2 / 96.2 Maximum ocean visibility for all alternatives	See Alternative B	See Alternative B	Intact open ocean setting, in immediate proximity of Project (all alternatives) components for duration of Project.	Major

Table G-43c. Seascape Landscape Impact Assessment for Alternative C (Habitat Alternative) - Specially Designated Areas

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Proposed Action (Alternative B)	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative C1	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative C2	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Historic Sites and National Landmarks	12,308.0	AI01, AI03, BI04, BI12, BI13, C01, C02, BI13, MM04, MV07, MV09, MV13, RI01	1,222.08 / 9.9	1,218.8 / 9.9	1,218.6/ 9.9	Alternatives C2 would have negligible reduction in visible acres across all Specially Designated Areas as compared to the Proposed Action and overall impacts would remain similar.	Major
National Natural Landmarks	349.7	MV07	255.5 / 73.1	252.3/ 72.2	249.5 / 71.4		Moderate
State Scenic Areas	105,777.6	BI12, CI01, MV07	18,205.6 / 17.2	18,069.1 / 17.1	17,986.7 / 17.0		Major
National Wildlife Refuges	15,176.1	AI05, NL01, RI06	767.7 / 5.1	764.2 / 5.0	762.9 / 5.0		Minor
State/ Non-Profit Wildlife Management Areas	31,967.8	AI07	1,31.4 / .4	131.2 / .4	131.1 / .4		Minor
National Parks	31.2	N/A	.2 / .7	.2 / .7	.2 / .7		Negligible
State Parks	10,473.8	AI01, LI04, MV10, RI08	27,31.7 / 26.1	27,29.6 / 26.1	2,728.6 / 26.1		Moderate
State Nature and Historic Preserves	248.4	N/A	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2		Negligible
State Forests	5,301.6	N/A	7.8 / .2	7.6 / .1	7.7 / .1		Negligible
State Beaches	165.1	N/A	78.2/ 47.4	78.2 / 47.4	78.1 / 47.3		Moderate
Highways Designated or Eligible as Scenic	411.6	N/A	43.4 / 10.5	43.1 / 10.5	43.1 / 10.5		Moderate
National Historic Trails	990.1	N/A	.8 / .1	.8 / .1	.75 / .1		Minor
National Recreation Trails	88.6	AI03	65.1 / 73.4	65.1 / 73.4	65.1 / 73.4		Major
State Fishing and Boating Access Sites	371.4	N/A	78.4 / 21.1	78.2 / 21.1	78.0 / 21.0		Moderate
Lighthouses	23.0	BI04, C01, MM04, MV09, RI01	6.6 / 28.7	6.6 / 28.6	6.6 / 28.6		Major
Public Beaches	4,221.0	AI06, MM01, MV02, MV03, MV05, MV11, NI10, RI09	11,38.8 / 27.0	1,137.3 / 27.0	1,135.7 / 26.9		Moderate
Ferry Routes	10,641.7	N/A	6,365.0 / 59.8	6,364.8 / 59.8	6,364.7 / 59.8		Moderate
Seaports	90.1	N/A	2.3 / 2.5	2.0 / 2.2	1.8 / 2.1		Negligible
Other State Land with Public Access	9,361.8	N/A	325.3 / 3.5	324.1 / 3.5	323.1 / 3.5		Negligible
Total Acres for Comparison	**195,700.8**		**30,208.0 / 15.4**	**30,058.6 / 15.4**	**29,967.9 / 15.3**	–	–

Table G-44a. Visual Impact Assessment Impacts Matrix - Alternative D (Transit Alternative) (see Table G-44b for continuation table)

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative D1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D1	Distance to Nearest Turbine (miles/nautical miles) Alternative D2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D2	Distance to Nearest Turbine (miles/nautical miles) Alternative D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D2
AI01	Brenton Point State Park	Medium	16.7/14.5	16.7/14.5	26.9/23.4	N/A	N/A	18.5/16.1	16.7/14.5	N/A
AI01	Brenton Point State Park - Night	Medium	16.7/14.5	16.7/14.5	27.0/23.4	N/A	N/A	18.5/16.1	16.7/14.5	N/A
AI03	Newport Cliff Walk	High	15.3/13.3	15.3/13.3	26.5/23.0	N/A	N/A	17.2/14.9	15.3/13.3	N/A

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative D1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D1	Distance to Nearest Turbine (miles/nautical miles) Alternative D2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D2	Distance to Nearest Turbine (miles/nautical miles) Alternative D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D2
AI05	Sachuest Point National Wildlife Refuge	High	14.8/12.9	14.8/12.9	27.5/23.9	N/A	N/A	17.0/14.7	14.8/12.9	N/A
AI06	Sachuest Beach (Second Beach)	Medium	16.0/13.9	16.0/13.9	28.6/24.9	N/A	N/A	18.2/15.8	16.0/13.9	N/A
AI07	Hanging Rock (Norman Bird Sanctuary)	High	16.2/14.1	16.2/14.1	28.8/25.1	N/A	N/A	18.4/16.0	16.2/14.1	N/A
BI04	Southeast Lighthouse	High	15.3/13.3	15.3/13.3	18.5/16.1	N/A	N/A	15.5/13.4	15.3/13.3	N/A
BI04	Southeast Lighthouse - Night	High	15.3/13.4	15.3/13.3	18.5/16.1	N/A	N/A	15.5/13.4	15.3/13.3	N/A
BI12	Clayhead Trail	High	15.9/13.8	15.9/13.8	20.3/17.6	N/A	N/A	16.7/14.5	15.9/13.8	N/A
BI13	North Light	High	17.2/15.0	17.2/15.0	21.7/18.9	N/A	N/A	18.0/15.7	17.2/15.0	N/A
CI01	Cuttyhunk Island	High	13.9/12.1	13.9/12.1	17.8/15.5	N/A	N/A	13.9/12.1	14.2/12.4	N/A
C01	Beavertail Lighthouse	Medium	18.4/15.9	18.4/15.9	27.6/24.0	N/A	N/A	20.0/17.4	18.4/15.9	N/A
LI04	Montauk Point State Park	Medium	31.5/27.4	31.5/27.4	33.8/29.4	N/A	N/A	31.5/27.3	31.9/27.7	31.5/27.4
LI04	Montauk Point State Park - Night	High	31.5/27.4	31.5/27.4	33.8/29.4	N/A	N/A	31.5/27.4	31.9/27.7	31.5/27.4
MM01	Gooseberry Island	Medium	15.2/13.2	15.2/13.2	22.4/19.5	N/A	N/A	16.6/14.5	15.1/13.2	N/A
MM04	Nobska Lighthouse	Medium	28.2/24.5	28.2/24.5	33.7/29.3	N/A	N/A	N/A	N/A	N/A
MV02	Philbin Beach	High	13.6/11.8	13.6/11.8	18.8/16.4	13.6/11.8	14.2/12.3	N/A	N/A	13.6/11.8
MV03	Lucy Vincent Beach	High	15.5/13.5	15.5/13.5	21.3/18.5	16.9/14.7	15.5/13.5	N/A	N/A	16.9/14.7
MV03	Lucy Vincent Beach - Sunset	Medium	15.5/13.5	15.5/13.5	21.3/18.5	16.9/14.7	15.5/13.5	N/A	N/A	16.9/14.7
MV05	Moshup Beach	High	13.8/12.0	13.7/11.9	19.2/16.5	13.7/11.9	14.5/12.6	N/A	N/A	13.7/11.9
MV05	Moshup Beach - Sunset	High	13.8/12.1	13.7/11.9	19.2/16.5	13.7/11.9	14.5/12.6	N/A	N/A	13.7/11.9
MV07	Aquinnah Overlook	High	13.7/12.0	13.7/12.0	19.3/16.8	13.7/11.9	14.9/12.9	N/A	N/A	13.7/11.9
MV07	Aquinnah Overlook - Sunset	High	13.7/12.0	13.7/12.0	19.3/16.8	13.7/11.9	14.9/12.9	N/A	N/A	13.7/11.9
MV07	Aquinnah Overlook - Night	High	13.7/12.0	13.7/12.0	19.3/16.8	13.7/11.9	14.9/12.9	N/A	N/A	13.7/11.9
MV09	Gay Head Lighthouse	High	13.9/12.1	13.9/12.1	19.4/16.9	13.9/12.1	15.0/13.0	N/A	N/A	13.9/12.1
MV10	South Beach State Park	High	22.0/19.1	22.0/19.1	28.6/24.9	25.3/22.0	22.0/19.1	N/A	N/A	25.3/22.0
MV11	Wasque Point	Low	24.8/21.5	24.8/21.5	31.5/27.4	N/A	N/A	N/A	N/A	N/A
MV12	Peaked Hill Reservation	Medium	16.3/14.2	16.3/14.2	22.0/19.1	17.3/15.1	16.3/14.2	N/A	N/A	17.3/15.1
MV12	Peaked Hill Reservation - Sunset	High	16.3/14.2	16.3/14.2	22.0/19.1	17.3/15.1	16.3/14.2	N/A	N/A	17.3/15.1

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative D1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D1	Distance to Nearest Turbine (miles/nautical miles) Alternative D2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D2	Distance to Nearest Turbine (miles/nautical miles) Alternative D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D2
MV13	Edwin DeVries Vanderhoop Homestead	Medium	13.8/12.0	13.8/12.0	19.3/16.8	13.8/12.0	14.8/12.9	N/A	N/A	13.8/12.0
NL01	Nomans Land Island NWR - Sunset *(not occupied)*	Low	8.7/7.5	8.7/7.5	13.7/11.9	9.0/7.8	8.7/7.5	N/A	N/A	9.0/7.8
NL01	Nomans Land Island NWR *(not occupied)*	Medium	8.7/7.5	8.7/7.5	13.7/11.9	9.0/7.8	8.7/7.5	N/A	N/A	9.0/7.8
NI10	Madaket Beach	Medium	34.6/30.0	34.6/30.0	41.1/35.7	39.0/34.0	34.6/30.0	N/A	N/A	39.0/34.0
RI01	Watch Hill Lighthouse	Medium	32.8/28.5	N/A	N/A	N/A	N/A	33.6/29.3	32.8/28.5	N/A
RI06	Trustom Pond NWR	Medium	22.6/19.6	22.6/19.6	28.3/24.6	N/A	N/A	23.5/20.4	22.6/19.6	N/A
RI08	Scarborough Beach State Park	Medium	19.1/16.6	19.1/16.6	25.6/22.3	N/A	N/A	19.9/17.3	19.1/16.6	N/A
RI09	Narragansett Beach	Medium	20.0/17.4	20.0/17.4	28.0/24.3	N/A	N/A	21.4/18.6	20.0/17.4	N/A

Table G-44b. Visual Impact Assessment Impacts Matrix - Alternative D (Transit Alternative)

KOP Number	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D2	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1, D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1, D2 & D3	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
AI01	N/A	18.5/16.1	16.7/14.5	18.5/16.1	16.7/14.5	18.5/16.1	16.7/14.5	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible , though appear small in scale.	Moderate
AI01	N/A	18.5/16.1	16.7/14.5	18.5/16.1	16.7/14.5	18.5/16.1	16.7/14.5	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles which removes the first row of visible WTGs along the horizon. When viewed at night, warning lights will be visible along horizon where nighttime lighting does not currently exist.	Moderate
AI03	N/A	17.2/14.9	15.3/13.3	17.2/14.9	15.3/13.3	17.2/14.9	15.3/13.3	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles which reduces the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible, though appear small in scale.	Moderate
AI05	N/A	17.0/14.7	14.8/12.9	17.0/14.7	14.8/12.9	17.0/14.7	14.8/12.9	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible, though appear small in scale.	Moderate
AI06	N/A	18.2/15.8	16.0/13.9	18.2/15.8	16.0/13.9	18.2/15.8	16.0/13.9	D1& D2 & D3	Alternative D2 would increase the distance between the KOP and nearest turbine by approximately 2-miles which reduces the overall visibility of the WTGs along the horizon.	Minor
AI07	N/A	18.4/16.0	16.2/14.1	18.4/16.0	16.2/14.1	18.4/16.0	16.2/14.1	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible and prominent.	Moderate
BI04	N/A	15.5/13.4	15.3/13.3	15.5/13.4	15.3/13.3	15.5/13.4	15.3/13.3	D1& D2 & D3	Alternative D3 would negligibly increase the distance between the KOP and nearest WTGs as only one WTG would be removed that is nearest the KOP. Overall	Moderate

KOP Number	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D2	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1, D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1, D2 & D3	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
									the combinations of Alternatives D1 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	
BI04	N/A	15.5/13.4	15.3/13.3	15.5/13.4	15.3/13.3	15.5/13.4	15.3/13.3	D1& D2 & D3	Alternative D3 would negligibly increase the distance between the KOP and nearest WTGs as only one WTG would be removed that is nearest the KOP. Overall the combinations of Alternatives D1 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. When viewed at night, warning lights will continue be visible along horizon similar to the Proposed Action where nighttime lighting does not currently exist.	Major
BI12	N/A	16.7/14.5	15.9/13.8	16.7/14.5	15.9/13.8	16.7/14.5	15.9/13.8	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1-mile removing 1 string of WTGs. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Moderate
BI13	N/A	18.0/15.7	17.2/15.0	18.0/15.7	17.2/15.0	18.0/15.7	17.2/15.0	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1-mile removing 1 string of WTGs. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Moderate
CI01	N/A	13.9/12.1	14.2/12.4	13.9/12.1	14.2/12.4	13.9/12.1	14.2/12.4	D1& D2 & D3	Alternative D3 would negligibly increase the distance between the KOP and nearest WTGs as only two WTGs would be removed that is nearest the KOP. Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Major
C01	N/A	20.0/17.4	18.4/15.9	20.0/17.4	18.4/15.9	20.0/17.4	18.4/15.9	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 2-miles. The overall massing of the WTGs within the lease area would appear smaller in scale along the horizon as a result of the increased distance and influence of the curvature of the earth.	Minor
LI04	33.8/29.4	31.5/27.4	31.9/27.7	31.5/27.4	31.9/27.7	31.5/27.4	31.9/27.7	D1& D2 & D3	Alternative D1 would not be perceivable along horizon due to distance (over 30 miles) and atmospheric influences. Occasional blade tips and movement may be noticeable by the focused viewer or backlighting.	Negligible
LI04	33.8/29.4	31.5/27.4	31.9/27.7	31.5/27.4	31.9/27.7	31.5/27.4	31.9/27.7	D1& D2 & D3	The addition of aviation warning lights along the horizon within the viewshed would be perceivable by the focused viewer, but not a dominant element as compared to other existing warning lighting sources associated with BIWF that are in closer proximity (approximately 16 miles).	Negligible
MM01	N/A	16.6/14.5	15.1/13.2	16.6/14.5	15.1/13.2	16.6/14.5	15.1/13.2	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1.5-miles removing two of the WTGs. The overall massing of the WTGs (blades) within the lease area would continue to be perceivable along the horizon.	Minor
MM04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D1& D2 & D3	Alternative D3 would negligibly increase the distance between the KOP and nearest WTGs as only one WTG would be removed that is nearest the KOP. D3 would remove outer strings of WTGs when viewed far right of center. The overall massing of the WTGs (hub and blades) within the lease area would continue to be perceivable along the horizon.	Minor
MV02	14.2/12.3	N/A	N/A	13.6/11.8	14.2/12.3	13.6/11.8	14.2/12.3	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Moderate
MV03	15.5/13.5	N/A	N/A	16.9/14.7	15.5/13.5	16.9/14.7	15.5/13.5	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the left of Nomans Land Island which are unobstructed and prominent along the horizon. The remaining WTGs visible within the lease area would be partially obscured (towers) with hubs and blades still visible above the landform, but not a major focus of attention by beach users.	Minor

KOP Number	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D2	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1, D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1, D2 & D3	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
MV03	15.5/13.5	N/A	N/A	16.9/14.7	15.5/13.5	16.9/14.7	15.5/13.5	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the left of Nomans Land Island which are unobstructed and prominent along the horizon. The remaining WTGs visible within the lease area would be partially obscured (towers) with hubs and blades still visible above the landform, which, when backlit would continue to draw the viewers eye due to movement.	Moderate
MV05	14.5/12.6	N/A	N/A	13.7/11.9	14.5/12.6	13.7/11.9	14.5/12.6	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Major
MV05	14.5/12.6	N/A	N/A	13.7/11.9	14.5/12.6	13.7/11.9	14.5/12.6	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the left of Nomans Land Island which are unobstructed and prominent along the horizon. The remaining WTGs visible within the lease area, when backlit would continue to draw the viewers eye due to movement.	Moderate
MV07	14.9/12.9	N/A	N/A	13.7/11.9	14.9/12.9	13.7/11.9	14.9/12.9	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP.	Major
MV07	14.9/12.9	N/A	N/A	13.7/11.9	14.9/12.9	13.7/11.9	14.9/12.9	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP. The remaining WTGs visible within the lease area, when backlit would continue to draw the viewers eye due to movement and dark contrast.	Major
MV07	14.9/12.9	N/A	N/A	13.7/11.9	14.9/12.9	13.7/11.9	14.9/12.9	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP. WTG hazard lighting would be visible along the horizon based on turbine distance, with platform and tower lighting more prevalent with the first four strings of WTGs.	Moderate
MV09	15.0/13.0	N/A	N/A	13.9/12.1	15.0/13.0	13.9/12.1	15.0/13.0	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP.	Major
MV10	22.0/19.1	N/A	N/A	25.3/22.0	22.0/19.1	25.3/22.0	22.0/19.1	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the left of Nomans Land Island which are unobstructed and prominent along the horizon. The remaining WTGs visible within the lease area would be partially obscured (towers) with hubs and blades still visible continue to draw the viewers eye due to movement.	Moderate
MV11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the left of Nomans Land Island which are unobstructed and prominent along the horizon. The remaining WTGs visible within the lease area would be partially obscured (towers) with hubs and blades perceivable along the horizon based on lighting conditions.	Minor
MV12	16.3/14.2	N/A	N/A	17.3/15.1	16.3/14.2	17.3/15.1	16.3/14.2	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Major
MV12	16.3/14.2	N/A	N/A	17.3/15.1	16.3/14.2	17.3/15.1	16.3/14.2	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs and geometric form of the OSSs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP. The remaining WTGs visible within the lease area, when backlit would continue to draw the viewers eye due to movement and dark contrast.	Major

KOP Number	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D2	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D2 & D3	Distance to Nearest Turbine (miles/nautical miles) Alternatives D1, D2 & D3	Distance to Nearest Turbine Removed (miles/nautical miles) Alternatives D1, D2 & D3	Alternative with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
MV13	14.8/12.9	N/A	N/A	13.8/12.0	14.8/12.9	13.8/12.0	14.8/12.9	D1& D2 & D3	Alternative D2 would remove the majority of WTGs visible (8 WTGs) to the right of Nomans Land Island which are unobstructed and prominent along the horizon. A portion of the lease area would continue to be visible left of the OSS with the remaining predominantly obscured to the right of center of the KOP (right of the OSS) by intervening topography.	Major
NL01	8.7/7.5	N/A	N/A	9.0/7.8	8.7/7.5	9.0/7.8	8.7/7.5	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon.	Major
NL01	8.7/7.5	N/A	N/A	9.0/7.8	8.7/7.5	9.0/7.8	8.7/7.5	D1& D2 & D3	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 1-mile though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon. WTGs would continue to be visible center and left of center of the KOP.	Major
NI10	34.6/30.0	N/A	N/A	39.0/34.0	34.6/30.0	39.0/34.0	34.6/30.0	D1& D2 & D3	Overall the combinations of Alternatives D2 and D3 would remove outer strings of WTGs when viewed far left of center and far right of center. The overall massing of the WTGs within the lease area would continue to be visually prominent along the horizon and be the center of focus from the KOP. The remaining WTGs visible within the lease area, when backlit would continue to draw the viewers eye due to movement and dark contrast.	Negligible
RI01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1-mile which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row would not be visible.	Negligible
RI06	N/A	23.5/20.4	22.6/19.6	23.5/20.4	22.6/19.6	23.5/20.4	22.6/19.6	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1-miles which reduces the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible, though appear small in scale.	Minor
RI08	N/A	19.9/17.3	19.1/16.6	19.9/17.3	19.1/16.6	19.9/17.3	19.1/16.6	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 0.5-mile which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible, though appear small in scale.	Moderate
RI09	N/A	21.4/18.6	20.0/17.4	21.4/18.6	20.0/17.4	21.4/18.6	20.0/17.4	D1& D2 & D3	Alternative D3 would increase the distance between the KOP and nearest WTGs by approximately 1.5-miles which removes the first row of visible WTGs along the horizon. WTGs beyond the first removed row are still visible, though appear small in scale.	Moderate

Table G-45a. Seascape Landscape Impact Assessment for Alternative D (Transit Alternative) - Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Shoreline Beach	SCA	AI06, MV02, MV10, MV11,	35.3/ 2.4	35.3/2.4	32.0/2.2	34.7/2.3	31.8/2.1	34.6/2.3	34.6/2.3	31.1/2.1	Alternative D1& D2 & D3 would have minor reduction in visible	SCA - Moderate

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 & D3 Total SCA/LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
		NI10, RI08, RI09									acres across all SCAs and LCAs (approximately 4.2 square miles) as compared to the Proposed Action. The importance of SCAs for recreation and other uses along with residential areas of LCAs in close proximity of SCAs where ocean views dominate or are of high value, influence the overall impact level associated with the project and associated alternatives.	
Coastal Bluff	SCA	BI04, BI12, C01, MV07, MV13, NL01										
Developed Waterfront	SCA	N/A										
Shoreline Residential	SCA	AI03, RI01										
Coastal Dunes	SCA	BI13, MV03, MV05										
Salt Pond/ Tidal Marsh	SCA/LCA	RI06										SCA/LCA - Moderate
Inland Lakes and Ponds	SCA/LCA	N/A										
Maintained Recreation Area	SCA/LCA	AI01, AI03, BI04, C01, LI04, MM04, MV09, RI01										
Highway Transportation	SCA/LCA	N/A										
Coastal Scrub/ Shrub Forest	LCA	AI05 , AI07, CI01, MM01,										LCA - Minor
Agricultural/ Open Field	LCA	N/A										
Forest	LCA	MV12										
Rural Residential	LCA	N/A										
Suburban Residential	LCA	N/A										
Village/ Town Center	LCA	N/A										
Commercial	LCA	N/A										

Table G-45b. Seascape Landscape Impact Assessment for Alternative D (Transit Alternative) - Ocean Character Areas

Character Area Name	Character Area Association (SCA/LCA/ OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D2 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D3 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D3 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D2 & D3 Total OCA area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative D1 & D2 & D3 Total OCA area within Analysis Area: 6,113.4 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Open Ocean	OCA	N/A	5,882.2 / 96.2 Maximum ocean visibility as compared to all alternatives	See Alternative B	See Alternative B	See Alternative B	See Alternative B	See Alternative B	See Alternative B	See Alternative B	Intact open ocean setting, in immediate proximity of Project components for duration of Project.	Major

Table G-45c. Seascape Landscape Impact Assessment for Alternative D (Transit Alternative) - Specially Designated Areas

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Proposed Action (Alternative B)	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D2	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D2	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D2 & D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D2 & D3	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Historic Sites and National Landmarks	12,308.0	AI01, AI03, BI04, BI12, BI13, C01, C02, BI13, MM04, MV07, MV09, MV13, RI01	1,222.1 / 9.9	1,211.2 / 9.8	1,188.8 / 9.7	1,183.7 / 9.6	1,177.5 / 9.6	1172.3 / 9.5	1,150 / 9.3	1,139 / 9.2	Alternative D1& D2 & D3 would have a minor reduction in visible acres across all Specially Designated Areas as compared to the Proposed Action, though overall impacts would remain similar. The combination of Alternatives reduces a greater area of visibility resulting from the reduction of turbines along the eastern and northwestern portions of the lease area.	Major
National Natural Landmarks	349.7	MV07	255.5 / 73.1	255.5 / 73.1	248.9 / 71.2	254.6 / 72.8	247.6 / 70.8	254.6 / 72.8	248.0 / 70.9	246.7 / 70.5		Moderate
State Scenic Areas	105,777.6	BI12, CI01, MV07	18,205.6 / 17.2	18,179.6 / 17.2	17,365.0 / 16.4	17,944.7 / 17.0	17,303.0 / 16.4	17,912.6 / 16.9	17,092.3 / 16.2	17,029.4 / 16.1		Major
National Wildlife Refuges	15,176.1	AI05, NL01, RI06	767.7 / 5.1	767.3 / 5.1	738.7 / 4.9	754.3 / 5.0	736.7 / 4.9	753.7 / 5.0	725.11 / 4.8	723.1 / 4.8		Minor
State/ Non-Profit Wildlife Management Areas	31,967.8	AI07	1,31.4 / .4	130.9 /.4	125.5 / .4	120.6 / .4	123.7 / .4	120.1 / .4	114.7 / .4	112.9 / .4		Minor
National Parks	31.2	N/A	0.2 / 0.7	0.2 /.7	0.0 / 0	0.2 / .7	0.0 / 0	0.2 / .7	0.0 / 0	0.0 / 0		Negligible
State Parks	10,473.8	AI01, LI04, MV10, RI08	2,731.7 / 26.1	2,730.4 / 62.1	2,704.0 / 25.8	2,724.1 / 26.0	2,702.0 / 25.8	2,722.5 / 26.0	2,695.7 / 25.7	2,693.6 / 25.7		Moderate
State Nature and Historic Preserves	248.4	N/A	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2	3.1 / 1.2		Negligible
State Forests	5,301.6	N/A	7.8 / .2	7.8 / .2	2.2 / .04	7.8 / .1	2.1 / .04	7.8 / .1	2.2 / .04	2.1 / .04		Negligible
State Beaches	165.1	N/A	78.2/ 47.4	78.2 / 47.4	78.2 / 47.3	76.4 / 46.2	78.1 / 47.3	76.4 / 46.2	76.3 / 46.2	76.3 / 46.2		Moderate
Highways Designated or Eligible as Scenic	411.6	N/A	43.4 / 10.5	43.3 / 10.5	43.0 / 10.4	41.9 / 10.2	42.8 / 10.4	41.7 / 10.1	41.4 / 10.1	41.2 / 10.1		Moderate
National Historic Trails	990.1	N/A	0.8 / 0.1	0.7 / .1	0.7 / .1	0.6 / .1	0.7 / .1	0.6 / .1	0.6 /.1	0.6 / .1		Minor
National Recreation Trails	88.6	AI03	65.1 / 73.4	65.1 / 73.4	64.2 / 72.4	65.1 / 73.4	64.2 / 72.4	65.1 / 73.4	64.2 / 72.4	64.2 / 72.4		Major

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Proposed Action (Alternative B)	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D2	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D2	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D2 & D3	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative D1 & D2 & D3	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
State Fishing and Boating Access Sites	371.4	N/A	78.4 / 21.1	78.0 / 21.0	78.2 / 21.1	77.1 / 20.7	77.7 / 20.9	76.7 / 20.6	76.9 / 20.7	76.4 / 20.6		Moderate
Lighthouses	23.0	BI04, C01, MM04, MV09, RI01	6.6 / 28.7	6.6 / 28.7	6.2 / 27.0	6.6 / 28.5	6.2 / 27.0	6.6 / 28.5	6.2 / 27.0	6.2 / 27.0		Major
Public Beaches	4,221.0	AI06, MM01, MV02, MV03, MV05, MV11, NI10, RI09	11,38.8 / 27.0	1,137.1 / 27.0	1,099.5 / 26.1	1,126.0 / 26.7	1,097.5 / 26.0	1,124.2 / 26.6	1,086.5 / 25.7	1,084.4 / 25.7		Moderate
Ferry Routes	10,641.7	N/A	6,365.0 / 59.8	6,365.0 / 59.8	6,364.9 / 59.8	6,364.5 / 59.8	6,364.8 / 59.8	6,364.4 / 59.8	6,364.5 / 59.8	6,364.4 / 59.8		Moderate
Seaports	90.1	N/A	2.3 / 2.5	2.3 / 2.5	1.8 / 2.0	2.3 / 2.5	1.8 / 2.0	2.3 / 2.5	1.8 / 2.0	1.8 / 2.0		Negligible
Other State Land with Public Access	9,361.8	N/A	325.3 / 3.5	322.3 / 3.4	325.3 / 3.5	315.9 / 3.4	322.3 / 3.4	312.8 / 3.3	315.9 / 3.4	312.8 / 3.3		Negligible
Total Acres for Comparison	**195,700.8**		**30,208.0 / 15.4**	**30,174.3 / 15.4**	**29,250.8 / 14.9**	**29,886.8 / 15.3**	**29,175.7 / 14.9**	**29,846.3 / 15.3**	**30,066.5 / 15.4**	**28,840.4 / 14.7**	–	–

Table G-46. Visual Impact Assessment Impacts Matrix - Alternative E (Viewshed Alternative)

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative E1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E1	Distance to Nearest Turbine (miles/nautical miles) Alternative E2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E2	Alternative(s) with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
AI01	Brenton Point State Park	Medium	16.7/14.5	18.6/16.2	16.7/14.5	20.7/18.0	16.7/14.5	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
AI01	Brenton Point State Park - Night	Medium	16.7/14.5	18.6/16.3	16.7/14.6	20.7/18.1	16.7/14.5	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles. When viewed at night, single aviation warning lights on nacelle may be visible intermittently along horizon where nighttime lighting does not currently exist.	Moderate
AI03	Newport Cliff Walk	High	15.3/13.3	17.8/15.5	15.3/13.3	19.4/16.9	15.3/13.3	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
AI05	Sachuest Point National Wildlife Refuge	High	14.8/12.9	18.4/16.0	14.8/12.9	18.9/16.4	14.8/12.9	E1 and E2	Alternatives E1 and E2 would increase the distance between the KOP and nearest turbine by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
AI06	Sachuest Beach (Second Beach)	Medium	16.0/13.9	19.5/17.0	16.0/13.9	20.1/17.4	16.0/13.9	E2	Alternative E2 would increase the distance between the KOP and nearest turbine by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
AI07	Hanging Rock (Norman Bird Sanctuary)	High	16.2/14.1	19.8/17.2	16.2/14.1	20.3/17.7	16.2/14.1	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
BI04	Southeast Lighthouse	High	15.3/13.3	15.3/13.3	19.9/17.3	15.5/13.4	15.3/13.3	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Moderate

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative E1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E1	Distance to Nearest Turbine (miles/nautical miles) Alternative E2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E2	Alternative(s) with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
BI04	Southeast Lighthouse - Night	High	15.3/13.4	15.3/13.3	19.9/17.3	15.5/13.4	15.3/13.3	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Moderate
BI12	Clayhead Trail	High	15.9/13.8	15.9/13.8	19.9/17.3	16.7/14.5	15.9/13.8	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Minor
BI13	North Light	High	17.2/15.0	17.2/15.0	21.0/18.2	18.0/15.7	17.2/15.0	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Minor
CI01	Cuttyhunk Island	High	13.9/12.1	19.2/16.7	13.9/12.1	14.9/12.9	13.9/12.1	E1	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Moderate
MM01	Gooseberry Island	Medium	15.2/13.2	20.7/18.0	15.1/13.2	17.8/15.5	15.1/13.2	E1	Alternative E2 would increase the distance between the KOP and nearest turbine by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
MM04	Nobska Lighthouse	Medium	28.2/24.5	28.2/24.5	28.3/24.6	28.2/24.5	28.3/24.6	E1	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 4-miles which reduces the overall visibility of the WTGs along the horizon.	Negligible
MV02	Philbin Beach	High	13.6/11.8	14.2/12.3	13.6/11.8	13.6/11.8	13.8/12.0	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately .5-miles though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon. WTGs would continue to be visible left of center of the KOP beyond Nomans Land Island.	Moderate
MV03	Lucy Vincent Beach	High	15.5/13.6	15.5/13.4	16.9/14.7	15.5/13.5	18.7/16.3	E1	Alternative E1 would increase the distance between the KOP and turbines far right of center of the KOP along the horizon of the landform removing visibility, where WTGs are visible as part of the Proposed Action. WTGs would continue to be visible left of center of the KOP, similar to the Proposed Action.	Moderate
MV03	Lucy Vincent Beach - Sunset	Medium	15.5/13.7	15.5/13.5	16.9/14.8	15.5/13.5	18.7/16.3	E1	Alternative E1 would increase the distance between the KOP and turbines far right of center of the KOP along the horizon of the landform removing visibility, where WTGs are visible as part of the Proposed Action. WTGs would continue to be visible left of center of the KOP, similar to the Proposed Action.	Major
MV05	Moshup Beach	High	13.8/12.0	14.5/12.6	13.7/11.9	13.7/11.9	13.7/11.9	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 1-mile though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon. WTGs would continue to be visible center and left of center of the KOP.	Moderate
MV05	Moshup Beach - Sunset	High	13.8/12.1	14.5/12.7	13.7/11.9	13.7/11.9	13.7/11.9	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 1 -mile though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon. WTGs would continue to be visible center and left of center of the KOP where backlighting creates contrast.	Moderate
MV07	Aquinnah Overlook	High	13.7/12.0	14.9/12.9	13.7/11.9	14.0/12.2	13.7/11.9	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 1-mile though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon, particularly with atmospheric conditions. WTGs would continue to be visible center and left of center of the KOP.	Moderate
MV07	Aquinnah Overlook - Sunset	High	13.7/12.0	14.9/12.9	13.7/11.9	14.0/12.2	13.7/11.9	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 1-mile though a greater reduction of WTGs when viewed from center to right of center of the KOP would be reduced along the horizon. WTGs would continue to be visible center and left of center of the KOP.	Moderate
MV07	Aquinnah Overlook - Night	High	13.7/12.0	14.9/12.9	13.7/11.9	14.0/12.2	13.7/11.9	E1	Alternative E1 would increase the distance between the KOP and nearest WTG (lighting) by approximately 1-mile though a greater reduction of WTG lighting	Moderate

KOP Number	KOP Name	SLVIA Sensitivity Rating (high, medium, low)	Distance to Nearest Turbine (miles/nautical miles) Proposed Action	Distance to Nearest Turbine miles/nautical miles) Alternative E1	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E1	Distance to Nearest Turbine (miles/nautical miles) Alternative E2	Distance to Nearest Turbine Removed (miles/nautical miles) Alternative E2	Alternative(s) with greatest reduced visual impact to KOP as compared to the Proposed Action	VIA Overall Impact Level Rationale	VIA Overall Impact Level (major, moderate, minor, negligible)
									when viewed from center to right of center of the KOP would be reduced along the horizon. WTG lighting would continue to be visible center and left of center of the KOP.	
MV09	Gay Head Lighthouse	High	13.9/12.1	15.0/13.0	13.9/12.1	14.1/12.3	13.9/12.1	E1	Alternative E1 would increase the distance between the KOP and nearest WTGs by approximately 2-miles. Though a greater reduction of WTGs when viewed from left of center of the KOP would be reduced to the far horizon (approximately 16-20-miles). WTGs would continue to be visible right of center KOP to include the OSS.	Moderate
MV10	South Beach State Park	High	22.0/19.1	22.0/19.1	25.3/22.0	22.0/19.1	28.6/24.9	E1 and E2	WTGs along eastern portion of lease area would remain for both Alternatives as compared to the Proposed Action with no visible change.	Moderate
MV11	Wasque Point	Low	24.8/21.5	24.8/21.5	28.5/24.8	24.8/21.5	32.1/28.0	E1 and E2	WTGs along eastern portion of lease area would remain for both Alternatives as compared to the Proposed Action with no visible change.	Minor
MV12	Peaked Hill Reservation	Medium	16.3/14.2	16.3/14.2	17.3/15.1	16.314.2	18.7/16.2	E1	Alternative E1 would increase the distance (approximately 10-miles) between the KOP and turbines at the far right of center of the KOP along the horizon. WTGs would continue to be visible center and left of center of the KOP, similar to the Proposed Action.	Moderate
MV12	Peaked Hill Reservation - Sunset	High	16.3/14.2	16.3/14.3	17.3/15.1	16.314.2	18.7/16.2	E1	Alternative E1 would increase the distance (approximately 10-miles) between the KOP and turbines at the far right of center of the KOP along the horizon. WTGs would continue to be visible center and left of center of the KOP, similar to the Proposed Action where backlighting creates contrast.	Major
MV13	Edwin DeVries Vanderhoop Homestead	Medium	13.8/12.0	14.8/12.9	13.8/12.0	14.0/12.1	13.8/12.0	E1	Alternative E1 would increase the distance (approximately 20-miles) between the KOP and turbines at the far right of center of the KOP, though topography blocks right of KOP views. WTGs would continue to be visible center and left of center of the KOP, similar to the Proposed Action.	Major
NI10	Madaket Beach	Medium	34.6/30.0	34.6/30.0	39.7/34.5	34.6/30.0	45.0/39.0	E1 and E2	Alternatives E1 and E2 would have similar views of WTGs along the far horizon, with turbine blade tips visible within a narrow view, during clear viewing conditions. Due to distance, WTGs would be predominately obscured.	Minor
NL01	Nomans Land Island NWR *(not occupied)*	Low	8.7/7.5	8.7/7.5	9.0/7.8	8.7/7.5	12.1/10.5	E1	Alternative E1 would increase the distance (approximately 16 to 19-miles) between the KOP and turbines at the far right of center of the KOP. WTGs would continue to be visible center and left of center of the KOP, similar to the Proposed Action.	Moderate
NL01	Nomans Land Island NWR - Sunset *(not occupied)*	Medium	8.7/7.5	8.7/7.6	9.0/7.8	8.7/7.5	12.1/10.5	E1	Alternative E1 would increase the distance (approximately 16 to 19-miles) between the KOP and turbines at the far right of center of the KOP. WTGs would continue to be visible center and left of center of the KOP, similar to the Proposed Action.	Major
RI06	Trustom Pond NWR	Medium	22.6/19.6	22.6/19.6	23.8/20.7	23.5/20.4	22.6/19.6	E2	The reduction of WTGs would remove visibility of the WTGs along the horizon within the lease area. an occasional blade tip may be perceivable but not an influencing factor in overall impact.	Negligible
RI08	Scarborough Beach State Park	Medium	19.1/16.6	19.1/16.6	19.3/16.7	20.2/17.5	19.1/16.6	E2	E2 would have slightly less impacts as compared to E1. The reduction of WTGs in close proximity of the KOP would not decrease visibility of the WTGs along the horizon. WTG reduction would be localized to the far left of center of the KOP, with the majority of the WTGs remaining within the center of view.	Moderate
RI09	Narragansett Beach	Medium	20.0/17.4	20.7/18.0	20.0/17.4	22.3/19.4	20.0/17.4	E2	Alternative E2 would increase the distance between the KOP and nearest WTGs by approximately 2-miles. WTG reduction would be localized to the center of the KOP, with the majority of the WTGs remaining to the right of center of the KOP.	Moderate

Table G-47a. Seascape Landscape Impact Assessment for Alternative E (Viewshed Alternative) - Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total SCA and LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative E1 Total SCA and LCA area within Analysis Area: 1,488.1 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative E2 Total SCA and LCA area within Analysis Area: 1,488.1 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Shoreline Beach	SCA	AI06, MV02, MV10, MV11, NI10, RI08, RI09	35.3 / 2.4	32.7 / 2.2	33.5 / 2.3	Alternatives E1 would have negligible reduction in visible acres across all SCAs and LCAs (approximately 2.6 square miles) as compared to the Proposed Action. The importance of SCAs for recreation and other uses along with residential areas of LCAs in close proximity of SCAs where ocean views dominate or are of high value, influence the overall impact level associated with the project and associated alternatives.	SCA - Moderate
Coastal Bluff	SCA	BI04, BI12, C01, MV07, MV13, NL01					
Developed Waterfront	SCA	N/A					
Shoreline Residential	SCA	AI03, RI01					
Coastal Dunes	SCA	BI13, MV03, MV05					
Salt Pond/ Tidal Marsh	SCA/LCA	RI06					SCA/LCA - Moderate
Inland Lakes and Ponds	SCA/LCA	N/A					
Maintained Recreation Area	SCA/LCA	AI01, AI03, BI04, C01, LI04, MM04, MV09, RI01					
Highway Transportation	SCA/LCA	N/A					
Coastal Scrub/ Shrub Forest	LCA	AI05, AI07, CI01, MM01,					LCA - Minor
Agricultural/ Open Field	LCA	N/A					
Forest	LCA	MV12					
Rural Residential	LCA	N/A					
Suburban Residential	LCA	N/A					
Village/ Town Center	LCA	N/A					
Commercial	LCA	N/A					

Table G-47b. Seascape Landscape Impact Assessment for Alternative E (Viewshed Alternative) - Ocean Character Areas

Character Area Name	Character Area Association (SCA/LCA/OCA)	Key Observation Points with Simulations	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative B - Proposed Action Total Ocean area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative E1 Total Ocean area within Analysis Area: 6,113.4 Square Miles	Geographic Extent of Analysis Area with Visibility of Alternative (square miles/percentage) Alternative E2 Total Ocean area within Analysis Area: 6,113.4 Square Miles	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Open Ocean	OCA	N/A	5,882.2 / 96.2 Maximum ocean visibility as compared to all alternatives	See Alternative B	See Alternative B	Intact open ocean setting, in immediate proximity of Project components for duration of Project.	Major

Table G-47c. Seascape Landscape Impact Assessment for Alternative E (Viewshed Alternative) - Specially Designated Areas

Specially Designated Areas	Specially Designated Area Total Acres	Key Observation Points with Simulations	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Proposed Action (Alternative B)	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative E1	Geographic Extent of Specially Designated Area with Visibility of Alternative (acres/percentage) Alternative E2	SLIA Overall Impact Level Rationale for the Alternative with the reduced level of impacts as compared to the Proposed Action	SLIA Overall Impact Level (major, moderate, minor, negligible)
Historic Sites and National Landmarks	12,308.0	AI01, AI03, BI04, BI12, BI13, C01, C02, BI13, MM04, MV07, MV09, MV13, RI01	1,222.8 / 9.9	1,103.3 / 9.0	1,121.7 / 9.1	Alternatives E1 would have negligible reduction in visible acres across all Specially Designated Areas as compared to the Proposed Action and overall impacts would remain similar.	Major
National Natural Landmarks	349.7	MV07	255.5 / 73.1	252.1 / 72.2	252.7 / 72.3		Moderate
State Scenic Areas	105,777.6	BI12, CI01, MV07	18,205.6 / 17.2	17,359.2/ 16.4	17,528.0 / 16.5		Major
National Wildlife Refuges	15,176.1	AI05, NL01, RI06	767.7 / 5.1	737.6 / 4.9	734.3 / 4.8		Minor
State/ Non-Profit Wildlife Management Areas	31,967.8	AI07	131.4 / .4	123.7 / .4	114.1 / .4		Minor
National Parks	31.2	N/A	.2 / .7	0.2 / .7	0.2 / .7		Negligible
State Parks	10,473.8	AI01, LI04, MV10, RI08	27,31.7 / 26.1	2,638 / 25.2	2,699.8 / 25.8		Moderate
State Nature and Historic Preserves	248.4	N/A	3.1 / 1.2	2.6 / 1.0	2.4 / 1.0		Negligible
State Forests	5,301.6	N/A	7.8 / .2	7.7 / .1	7.7 / .1		Negligible
State Beaches	165.1	N/A	78.2/ 47.4	75.1 / 45.5	74.3 / 45.0		Moderate
Highways Designated or Eligible as Scenic	411.6	N/A	43.4 / 10.5	39.7 / 9.7	39.3 / 9.6		Moderate
National Historic Trails	990.1	N/A	.8 / .1	.7 /.1	.5 / .04		Minor
National Recreation Trails	88.6	AI03	65.1 / 73.4	64.8 / 73.2	64.9 / 73.2		Major
State Fishing and Boating Access Sites	371.4	N/A	78.4 / 21.1	74.5 / 20.1	74.8 / 20.2		Medium
Lighthouses	23.0	BI04, C01, MM04, MV09, RI01	6.6 / 28.7	6.5 / 28.3	6.5 / 28.3		Major
Public Beaches	4,221.0	AI06, MM01, MV02, MV03, MV05, MV11, NI10, RI09	11,38.8 / 27.0	1,053 / 25.0	1,109.2 / 26.3		Moderate
Ferry Routes	10,641.7	N/A	6,365.0 / 59.8	6363.8 / 59.8	6,363.0 / 59.8		Moderate
Seaports	90.1	N/A	2.3 / 2.5	2.2 / 2.5	2.3 / 2.5		Negligible
Other State Land with Public Access	9,361.8	N/A	325.3 / 3.5	282.1 / 3.0	309.2 / 3.3		Negligible
Total Acres For Comparison	**195,700.8**		**30,208.0 / 15.4**	**29,084.8 / 14.9**	**29,384.5 / 15.0**	–	–

Table G-48. Visual Impact Assessment Impacts Matrix for Cumulative Impacts

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Cumulative Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Lease Area within Viewshed in Addition to Proposed Action	Geographic Extent Rating (large, medium, small)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
BI04	Southeast Lighthouse	SCA	East	161.1	Yes	VTL2	15.3/13.3	180	Highly visible and likely to attract the attention of lighthouse visitors based on lighting conditions, although not as prominent as the existing BIWF.	Medium	OCS-A 0517 OCS-A 0487	Medium	Visibility based on lighting conditions, existing BIWF visibility, duration	**Medium**	Importance of recreation and historic resources, duration and visibility from KOP based on lighting conditions	**Moderate**
BI04	Southeast Lighthouse - Night	SCA	East	161.1	Yes	VTL 4	15.3/13.4	180	The addition of the flashing warning lights on the WTGs and decks will add evidence of human development and increase visual clutter at the horizon.	Large	OCS-A 0517 OCS-A 0487	Large	Visibility based on lighting conditions, existing BIWF visibility, duration	**Large**	Importance of recreation and historic resources, duration and visibility from KOP based on lighting conditions	**Major**
BI12	Clayhead Trail	SCA	East	78.8	No	VTL1	15.9/13.8	180	Visible and likely to attract attention resulting from angle of view of WTGs	Medium	OCS-A 0517 OCS-A 0487	Medium	Visibility of WTGs within viewshed along horizon line within viewshed	**Medium**	Importance of preservation of scenic district and uses; proximity and visibility of Project	**Moderate**
BI13	North Light	SCA	East	27.5	No	VTL4	17.2/15.0	160	Turbines become the focus of views out to the water and the tight spacing and numerous turbines along the horizon draw the viewers' eye away from natural features.	Large	OCS-A 0517 OCS-A 0487	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of recreation and historic resources; proximity of residential viewers, duration and visibility from KOP	**Moderate**
LI04	Montauk Point State Park	SCA/LCA	East	48.0	Yes	VTL1	31.5/27.4	180	Due to distance and viewer position in relation to other features in the landscape, the right field of view would have some visibility of WTG blades associated with OCS-A 0487.	Small	OCS-A 0517 OCS-A 0487	Large	Projects would become perceivable along horizon, though will be variable due to distance and atmospheric influences	**Medium**	Project would not be perceivable along horizon due to distance and atmospheric influences. Occasional blade tips and movement may be noticeable by the focused viewer or backlighting.	**Minor**
LI04	Montauk Point State Park - Night	SCA/LCA	East	48.0	Yes	VTL2	31.5/27.4	180	Due to distance and viewer position in relation to other features in the landscape, there would be a negligible change.	Small	OCS-A 0517 OCS-A 0487	Small	Additional projects would not be perceivable along horizon if observer views were focused toward lighting. Light house illumination is most prominent.	**Small**	Additional lighting is negligible on horizon right of KOP viewshed. Lighthouse illumination is the focus.	**Negligible**
MV02	Philbin Beach	SCA	South-Southwest to West-Southwest	10.5	No	VTL5	13.6/11.8	180	Turbines are very visible on the horizon line and will dominate the view from the KOP.	Large	OCS-A 0487 OCS-A 0500	Large	Additional WTGs visible to left of KOP at approximately same distance as eastern portion of Proposed Action.	**Large**	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines within viewshed	**Moderate**
MV03	Lucy Vincent Beach	SCA	South-Southwest to Southwest	27.7	No	VTL 3	15.5/13.5	180	More direct views of additional lease areas. Visible and likely to attract the attention resulting from angle of view of WTGs.	Medium	OCS-A 0487 OCS-A 0500	Medium	Visibility of WTGs within viewshed along horizon line within viewshed, through further visibility is beyond horizon	**Medium**	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	**Moderate**

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Cumulative Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Lease Area within Viewshed in Addition to Proposed Action	Geographic Extent Rating (large, medium, small)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
MV03	Lucy Vincent Beach - Sunset	SCA	South-Southwest to Southwest	27.7	No	VTL 4	15.5/13.6	180	WTGs appear dark gray against the light sky and the position of the sun serves as a focal point, drawing the viewer's eye toward part of the proposed Project.	Large	OCS-A 0487 OCS-A 0500	Medium	Visibility of backlit WTGs within viewshed along horizon line within viewshed	**Large**	Scenic values; prominence of turbines- sunset backlighting of turbines along with movement influences prominence	**Major**
MV05	Moshup Beach	SCA	South-Southwest to West-Southwest	23.1	No	VTL 5	13.7/11.9	180	With the proposed RWF in place, the nacelles and rotors from numerous WTGs and two OSSs will be visible from this KOP in the background along the horizon.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of natural landscape and natural recreation opportunities, scenic values; prominence of turbines	**Moderate**
MV05	Moshup Beach - Sunset	SCA	South-Southwest to West-Southwest	23.1	No	VTL 5	13.7/11.10	180	WTGs appear dark gray against the light sky and the position of the sun serves as a focal point, drawing the viewer's eye toward part of the proposed Project.	Large	OCS-A 0487 OCS-A 0500	Large	Visibility of backlit WTGs within viewshed along horizon line within viewshed	**Large**	Scenic values; prominence of backlit turbines on the horizon	**Major**
MV07	Aquinnah Overlook	SCA	South to Southwest	145.5	Yes	VTL 3	13.7/11.9	180	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Prominent, dedicated viewpoint	**Major**
MV07	Aquinnah Overlook - Sunset	SCA	South to Southwest	145.5	Yes	VTL 5	13.7/11.10	180	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Prominent, dedicated viewpoint	**Major**
MV07	Aquinnah Overlook - Night	SCA	South to Southwest	145.5	Yes	VTL 3	13.7/11.11	180	OSSs become focal points along the wide horizon and the overlook is no longer just for views of the ocean but includes the turbines on the ocean.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Prominent, dedicated viewpoint; warning lighting appears low on the horizon	**Major**
MV09	Gay Head Lighthouse	SCA	South to West-Southwest	162.1	No	VTL 4	13.9/12.1	180	The two OSSs appear as dark elements on the horizon suspended above the water surface. From this superior vantage point, the entirety of the Project is visible.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of historic lighthouse, scenic values; prominence of turbines and OSSs	**Major**
MV10	South Beach State Park	SCA	Southwest to West-Southwest	17.0	No	VTL3	15.0/13.0	180	Nacelles and rotors from numerous WTGs will be visible in the background along the horizon. Turbines are visible on the horizon and provide a focal point.	Large	OCS-A 0487 OCS-A 0500 OCS-A 501	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of natural landscape and natural recreation opportunities; massing of turbines on horizon within full viewshed.	**Major**

KOP Number	KOP Name	Representative Character Area (SCA, LCA, OCA)	Viewing Direction	Elevation (feet)	Cumulative Simulation	Visibility Threshold	Distance to Nearest Turbine (miles/nautical miles)	Horizontal Field of View Occupied	Size or Scale Rationale	Size and Scale Rating (large, medium, small)	Lease Area within Viewshed in Addition to Proposed Action	Geographic Extent Rating (large, medium, small)	SLVIA Magnitude Rating Rationale	SLVIA Magnitude Rating (large, medium, small)	SLVIA Overall Impact Level Rationale	SLVIA Overall Impact Level (major, moderate, minor, negligible)
MV11	Wasque Point	SCA	West-Southwest	13.6	Yes	VTL 2	15.0/13.0	180	Nearest WTG is approximately 15 miles away; the towers are largely obscured due to curvature of the Earth, with their degree of exposure decreasing from left to right.	Large	OCS-A 0487 OCS-A 0500 OCS-A 501	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of natural landscape and natural recreation opportunities; massing of turbines on horizon within full viewshed.	**Major**
MV12	Peaked Hill Reservation	LCA	South-Southwest to Southwest	305.1	No	VTL 1	16.3/14.2	180	KOP on Peaked Hill represents a discrete view to the southwest that requires the viewer to be perfectly positioned.	Small	OCS-A 0487 OCS-A 0500	Small Based on simulation graphic all are visible / vegetation and perspective influence	Size and scale in relation to existing conditions, vegetation and viewer perspective	**Small**	Importance of cultural significance and natural recreation opportunities; visibility of WTGs due to intervening vegetation and landforms	**Major**
MV12	Peaked Hill Reservation - Sunset	LCA	South-Southwest to Southwest	305.1	No	VTL4	16.3/14.2	180	Sunset illumination and backlighting influences change	Large	OCS-A 0487 OCS-A 0500	Large Based on simulation graphic all are visible / vegetation and perspective influence	Backlighting of WTGs, increased visibility	**Large**	Importance of cultural significance and natural recreation opportunities; visibility of WTGs due to backlighting	**Major**
MV13	Edwin DeVries Vanderhoop Homestead	SCA	South to Southwest	17.0	No	VTL5	13.8/12.0	180	WTGs are visible; light gray towers, nacelles, and rotors are fully visible above the horizon.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Importance of natural landscape and natural recreation opportunities; visibility of WTGs due to distance and percentage of visibility	**Major**
NI10	Madaket Beach	SCA	West	20.6	Yes	VTL1	17.0/ 14.8	180	WTGs are barely visible along the horizon, with a small cluster of turbine blades and nacelle comprising the majority of visible features.	Small	OCS-A 0500 OCS-A 501 OCS-A 520 OCS-A 521 OCS-A 522	Small although numerous Lease Areas are within viewshed	Variable lighting and atmospheric conditions influence visibility	**Small**	Numerous lease areas are within viewshed, though perceivability of WTGs from KOP is highly influenced on visibility conditions.	**Major**
NL01	Nomans Land Island NWR *(not occupied)*	SCA	West-Southwest	42.1	Yes	VTL5	8.7/7.5	180	WTGs appear as gray vertical lines against the yellow backdrop of the sky that look out of character with the vast extent of open water.	Large	OCS-A 0487 OCS-A 0500	Large	Size and scale in relation to existing conditions along with percentage of visibility	**Large**	Intact seascape and prominence of WTGs in close proximity, although no viewers	**Major**
NL01	Nomans Land Island NWR - Sunset *(not occupied)*	SCA	West-Southwest	42.1	Yes	VTL6	8.7/7.6	180	Sunset illumination and backlighting influences change	Large	OCS-A 0487 OCS-A 0500	Large	Backlighting of WTGs, increased visibility	**Large**	Intact seascape and prominence of WTGs, although no viewers; backlighting of WTGs and OSS	**Major**

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APPENDIX H

List of Agencies, Organizations, and Persons to Whom Copies of the Statement Are Sent

Contents

Tables

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List of Agencies, Organizations, and Persons to Whom Copies of the Statement Are Sent

Table H-1. Federal Agencies

Cooperating Federal Agencies	Contact	Location
Bureau of Safety and Environmental Enforcement	Cheri Hunter (571) 474-6969 cheri.hunter@bsee.gov	Sterling, Virginia
National Oceanic and Atmospheric Administration	Sue Tuxbury (978) 281-9176 susan.tuxbury@noaa.gov	Gloucester, Massachusetts
U.S. Army Corps of Engineers	Christine Jacek (978) 318-8026 (978) 578-7548 christine.m.jacek@usace.army.mil	New England District
U.S. Coast Guard	George Detweiler (202) 372-1566 George.H.Detweiler@uscg.mil	Washington, D.C.
U.S. Environmental Protection Agency	Timothy Timmermann (617) 918-1025 Timmermann.Timothy@epa.gov	Boston, Massachusetts
Participating Federal Agencies	**Contact**	**Location**
Advisory Council on Historic Preservation	Chris Daniel (202) 517-0223 cdaniel@achp.gov	Washington, D.C.
Federal Aviation Administration	Cindy Whitten (816) 329-2528 Cindy.whitten@faa.gov	Washington, D.C.
National Park Service	Mary Krueger (978) 342-2719 Mary_C_Krueger@nps.gov	Fitchburg, Massachusetts
U.S. Department of Defense	Terry Bowers (703) 693-9447 (571) 232-2482 terry.l.bowers14.civ@mail.mil	New Alexandria, Virginia
U.S. Department of the Navy	Matthew Senska (703) 614-2201 Matthew.senska@navy.mil	Washington, D.C.
U.S. Fish and Wildlife Service	Jane Ledwin (703) 358-2585 Jane_Ledwin@fws.gov	Falls Church, Virginia

Table H-2. State and Local Agencies or Other Interested Parties

Agency	Contact	Location
Commonwealth of Massachusetts; Massachusetts Office of Coastal Zone Management	Lisa Engler (617) 626-1230 lisa.engler@state.ma.us	Boston, Massachusetts
Rhode Island Coastal Resources Management Council	Jeffrey Willis (401) 783-3370 jwillis@crmc.ri.gov	Wakefield, Rhode Island
State of Rhode Island; Rhode Island Department of Environmental Management	Terry Gray (401) 222-2771 terry.gray@dem.ri.gov	Providence, Rhode Island
Connecticut State Historic Preservation Office, Connecticut Department of Economic and Community Development	Mary Dunne (860) 500-2356 mary.dunne@ct.gov	Hartford, Connecticut
Rhode Island Historical Preservation & Heritage Commission	Jeffery Emidy (401) 222-4134 jeffrey.emidy@preservation.ri.gov	Providence, Rhode Island
New York State Division for Historic Preservation	Tim Lloyd (518) 268-2186 timothy.lloyd@parks.ny.gov	Waterford, New York
Massachusetts Historical Commission	Brona Simon (617) 727-2816 brona.simon@sec.state.ma.us	Boston, Massachusetts

Table H-3. Tribes and Native Organizations

Tribes and Native Organizations	State
Delaware Nation	Delaware
Delaware Tribe of Indians	Delaware
Mashantucket Pequot Tribal Nation	Connecticut
Mashpee Wampanoag Tribe	Massachusetts
Mohegan Tribe of Indians of Connecticut	Connecticut
Narragansett Indian Tribe	Rhode Island
Shinnecock Indian Tribe	New York
Wampanoag Tribe of Gay Head (Aquinnah)	Massachusetts

APPENDIX I

Other Impacts

Contents

Tables

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Unavoidable Adverse Impacts of the Proposed Action

Table I-1 summarizes unavoidable adverse impacts for each resource analyzed in the Revolution Wind Farm and Revolution Wind Export Cable Project (the Project) environmental impact statement (EIS). These impacts are subject to applicable environmental protection measures (EPMs) (see Table F-1 in Appendix F). Table I-1 does not include potential additional mitigation measures that could avoid or further minimize or mitigate Project impacts. Please see the individual resource discussions in Chapter 3 for detailed analyses.

Table I-1. Potential Unavoidable Adverse Impacts of the Action Alternatives by Resource

Resource Area	Potential Unavoidable Adverse Impacts of the Action Alternatives
Air quality	• Impacts from emissions from engines associated with vessel traffic, construction activities, equipment operation, and decommissioning activities
Bats	• Displacement and avoidance behavior due to habitat loss and alteration, equipment noise, and vessel traffic • Individual mortality due to collisions with operating wind turbine generator (WTGs)
Benthic habitat and invertebrates	• Increase in suspended sediments and resulting effects due to seafloor disturbance • Habitat quality impacts, including reduction in habitat as a result of seafloor surface alterations • Displacement, disturbance, and avoidance behavior due to habitat loss and alteration, equipment noise, vessel traffic, increased turbidity, sediment deposition, and electromagnetic fields (EMFs) • Individual mortality due to construction and installation, operations and maintenance (O&M), and decommissioning • Conversion of soft-bottom habitat to new hard-bottom habitat
Birds	• Displacement and avoidance behavior due to habitat loss and alteration, lighting, equipment noise, and vessel traffic • Individual mortality due to collisions with operating WTGs
Coastal habitats and fauna	• Displacement and avoidance behavior from habitat loss and alteration and equipment noise • Individual mortality from collisions with vehicles or construction equipment • Short-term habitat alteration and increased invasive species risk
Commercial fisheries and for-hire recreational fishing	• Disruption to access or temporary restriction in port access or harvesting activities due to construction of offshore Project elements • Disruption to harvesting activities during operations of offshore wind facility • Changes in vessel transit and fishing patterns • Changes in risk of gear entanglement or target species
Cultural resources	• Impacts to unidentified or undefined submerged marine resources from Project construction and installation, O&M, and decommissioning Impacts to terrestrial cultural resources and the viewshed from Project construction and installation and O&M • Visual impacts to onshore cultural resources

Resource Area	Potential Unavoidable Adverse Impacts of the Action Alternatives
Demographics, employment, and economics	• Disruption of commercial fishing, for-hire recreational fishing, and marine recreational businesses during offshore construction and cable installation • Hindrances to ocean economy sectors due to the presence of the offshore wind facility, including commercial fishing, recreational fishing, sailing, sightseeing, and supporting businesses
Environmental justice	• Changes to air quality, water quality, land use and coastal infrastructure, and commercial fisheries and for-hire recreational fishing that are disproportionately borne by minority or low-income populations from Project construction and installation, O&M, and decommissioning
Finfish and essential fish habitat	• Increase in suspended sediments and resulting effects due to seafloor disturbance • Habitat quality impacts, including a reduction in habitat as a result of seafloor surface alterations • Displacement, disturbance, and avoidance behavior due to habitat loss and alteration, equipment noise, vessel traffic, increased turbidity, sediment deposition, and EMFs • Individual mortality due to construction and installation, O&M, and decommissioning • Conversion of soft-bottom habitat to new hard-bottom habitat (for some species)
Land use and coastal infrastructure	• Land use disturbance due to construction as well as effects due to noise, vibration, and travel delays
Marine mammals	• Displacement, disturbance, and avoidance behavior due to habitat loss and alteration, equipment noise, vessel traffic, increased turbidity, and sediment deposition during construction and installation and O&M • Temporary loss of current ambient acoustic habitat and increased potential for vessel strikes
Navigation and vessel traffic	• Changes in vessel transit patterns • Increased navigational complexity and allision risk within the offshore wind farm area
Other uses	• Changes in access to marine mineral resource, and cable placement • Disruption of scientific surveys, radar systems, military, and aviation traffic
Recreation and tourism	• Disruption of coastal recreation activities during onshore construction, such as beach access • Viewshed effects from the WTGs altering enjoyment of marine and coastal recreation and tourism activities • Disruption to access or temporary restriction of in-water recreational activities from construction of offshore Project elements • Hindrances to some types of recreational fishing from the WTGs during operation
Sea turtles	• Disturbance, displacement, and avoidance behavior due to habitat loss and alteration, equipment noise, vessel traffic, increased turbidity, sediment deposition, and EMFs
Visual resources	• Change in scenic quality of landscape and seascape
Water quality	• Increase in erosion, turbidity and sediment resuspension, and inadvertent spills during construction and installation, O&M, and decommissioning
Wetlands and other waters of the U.S.	• Increase in soil erosion, sedimentation, and discharges and releases from land disturbance during construction and installation, O&M, and decommissioning

Irreversible and Irretrievable Commitment of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Irretrievable commitments are those that are lost for a period of time, such as the short-term loss of timber productivity in forested areas that are kept clear for a power line or a road. Table I-2 summarizes irreversible or irretrievable impacts for each resource analyzed in the EIS, subject to applicable EPMs. Table I-2 does not include potential additional mitigation measures that could avoid or further minimize or mitigate Project impacts. Chapter 3 provides a detailed discussion of effects associated with the Project.

Table I-2. Irreversible and Irretrievable Commitment of Resources by Resource Area for the Proposed Action

Resource Area	Irreversible Impacts	Irretrievable Impacts	Explanation
Air quality	No	No	The Bureau of Ocean Energy Management (BOEM) expects air emissions to be in compliance with permits regulating air quality standards, and emissions would be temporary during construction activities. If the Proposed Action displaces fossil fuel energy generation, overall improvement of air quality would be expected.
Bats	No	No	Irreversible impacts on bats could occur if one or more individuals were injured or killed; however, implementation of mitigation measures developed in consultation with the U.S. Fish and Wildlife Service (USFWS) would reduce or eliminate the potential for such impacts. Decommissioning of the Project would reverse the impacts of bat displacement from foraging habitat.
Benthic habitat and invertebrates	No	No	Although local mortality could occur, BOEM does not anticipate population-level impacts. The Project could alter habitat during construction and operations but could restore the habitat after decommissioning.
Birds	No	No	Irreversible impacts on birds could occur if one or more individuals were injured or killed; however, implementation of mitigation measures developed in consultation with the USFWS would reduce or eliminate the potential for such impacts. Decommissioning of the Project would reverse the impacts of bird displacement from foraging habitat.
Coastal habitats and fauna	No	No	Although local mortality could occur, BOEM does not anticipate population-level impacts on other coastal habitats or fauna. The Project could alter habitat during construction and operations but could restore the habitat after decommissioning.

Resource Area	Irreversible Impacts	Irretrievable Impacts	Explanation
Commercial fisheries and for-hire recreational fishing	No	Yes	Based on the anticipated duration of construction and installation and O&M, BOEM does not anticipate impacts on commercial fisheries to be irreversible. The Project could alter habitat during construction and operations, limit access to fishing areas during construction, or reduce vessel maneuverability during operations. However, decommissioning of the Project would reverse those impacts. Irretrievable impacts (lost revenue) could occur due to the loss of use of fishing areas at an individual level.
Cultural resources	Yes	Yes	Although unlikely, unanticipated removal or disturbance of previously unidentified cultural resources onshore and offshore could result in irreversible or irretrievable impacts.
Demographics, employment, and economics	No	No	Based on the anticipated duration of construction and installation and O&M, BOEM does not anticipate that contractor needs, housing needs, and supply requirements would lead to an irretrievable loss of workers for other projects or increase housing and supply costs.
Environmental justice	No	No	Potential environmental justice impacts, if any, would be short term and localized.
Finfish and essential fish habitat	No	No	Although local mortality could occur, BOEM does not anticipate population-level impacts. The Project could alter habitat during construction and operations but could restore the habitat after decommissioning.
Land use and coastal infrastructure	Yes	Yes	Land use required for construction and operations activities, such as the land proposed for the interconnection facility, could result in a minor irreversible impact. Construction activities could result in a minor irretrievable impact due to the temporary loss of use of the land for otherwise typical activities. Onshore facilities may or may not be decommissioned.
Marine mammals	No	Yes	Irreversible impacts on marine mammals could occur if one or more individuals of species listed under the Endangered Species Act (ESA) were injured or killed; however, NMFS consultation mitigation measures would reduce or eliminate the potential for such impacts on listed species. Irretrievable impacts could occur if individuals or populations grow more slowly as a result of displacement from the Lease Area.
Navigation and vessel traffic	No	Yes	Based on the anticipated duration of construction and installation and O&M, BOEM does not anticipate impacts on vessel traffic to result in irreversible impacts. Irretrievable impacts could occur due to changes in transit routes, which could be less efficient during the life of the Project.
Other uses	No	Yes	BOEM does not anticipate the potential impacts to be irreversible; however, disruption of offshore scientific research and surveys would occur during proposed Project construction, operations, and decommissioning activities.

Resource Area	Irreversible Impacts	Irretrievable Impacts	Explanation
Recreation and tourism	No	No	Construction activities near the shore could result in a minor temporary loss of use of the land for recreation and tourism purposes, but these impacts would not be irreversible or irretrievable.
Sea turtles	No	Yes	Irreversible impacts on sea turtles could occur if one or more individuals of species listed under the ESA were injured or killed; however, NMFS consultation mitigation measures would reduce or eliminate the potential for impacts on listed species. Irretrievable impacts could occur if individuals or populations grow more slowly as a result of displacement from the Lease Area.
Visual resources	No	Yes	Viewshed changes would persist for the life of the Project, until decommissioning is complete.
Water quality	No	No	BOEM does not expect activities to cause loss of or major impacts on existing inland waterbodies or wetlands. Turbidity and other water quality impacts in the marine and coastal environment would be short term, with the rare exception of a major spill.
Wetlands and other Waters of the U.S.	No	No	BOEM does not expect activities to cause loss of or major impacts on existing wetlands or other Waters of the U.S.

Relationship between the Short-Term Use of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

The Council on Environmental Quality's National Environmental Policy Act implementing regulations (40 CFR 1502.16) require that an EIS address the relationship between short-term use of the environment and the potential impacts of such use on the maintenance and enhancement of long-term productivity. Such impacts could occur as a result of a reduction in the flexibility to pursue other options in the future, or assignment of a specific area (land or marine) or resource to a certain use that would not allow other uses, particularly beneficial uses, to occur at a later date. An important consideration when analyzing such effects is whether the short-term environmental effects of the action would result in detrimental effects to long-term productivity of the affected areas or resources.

As assessed in EIS Chapter 3, BOEM anticipates that most of the potential adverse effects associated with the Proposed Action would occur during construction activities and would be temporary and minor or moderate. Table I-1 and Table I-2 identify unavoidable, irretrievable, or irreversible impacts that would be associated with the Project. However, the Bureau of Ocean Energy Management (BOEM) expects most of the marine and onshore environments to return to normal long-term productivity levels after Project decommissioning. Based on these findings, BOEM also anticipates that the Proposed Action would not result in impacts that would significantly narrow the range of future uses of the environment.

Additionally, the Project would provide the following long-term benefits:

- Promotion of clean and safe development of domestic energy sources and clean energy job creation
- Promotion of renewable energy to help ensure geopolitical security; combat climate change; and provide electricity that is affordable, reliable, safe, secure, and clean
- Delivery of power to the New England region to contribute to Connecticut’s and Rhode Island’s renewable energy goals
- Increased habitat for certain fish species

APPENDIX J

Finding of Adverse Effect for Historic Properties and Draft Memorandum of Agreement

Introduction

Attached to this appendix are the Bureau of Ocean Energy Management's (BOEM's) *Finding of Adverse Effect for the Revolution Wind Farm and Revolution Wind Export Cable Construction and Operations Plan* (Finding) and *Draft Memorandum of Agreement Among the Bureau of Ocean Energy Management, the State Historic Preservation Officers of Connecticut, Massachusetts, New York, and Rhode Island, and the Advisory Council on Historic Preservation Regarding the Revolution Wind Farm and Revolution Wind Export Cable Project* (MOA).

The Finding documents BOEM's determination of adverse effect on historic properties pursuant to this environmental impacts statement (EIS) analysis and to Sections 106 and 110 of the National Historic Preservation Act (NHPA), as guided by the Section 106 regulations in 36 Code of Federal Regulations 800. BOEM has found that the Revolution Wind Farm and Revolution Wind Export Cable Project (Project) would have an adverse effect on historic properties.

The MOA would be finalized and its requirements set by BOEM under NHPA Section 106 as a condition of BOEM's signing the record of decision. Mitigation measures for cultural resources are drafted in the MOA and its historic property treatment plans attached in this appendix. Under the MOA, adverse effects from the Project to National Register of Historic Places (NRHP)–eligible cultural resources, including National Historic Landmarks (NHLs) and traditional cultural properties (TCPs), would be avoided, minimized, or mitigated in accordance with the NHPA Section 106 regulations (36 CFR 800) and in compliance with Section 110(f).

The MOA also has attached post-review discovery plans for onshore and offshore cultural resources, should previously undiscovered or unimpacted historic properties be identified and moderate to major negative effects cannot be avoided. The post-review discovery plans would be implemented to assess and resolve any negative effects to these cultural resources. NRHP-eligible cultural resources that are discovered post-review, if adversely affected, would be mitigated through the NHPA Section 106 process.

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Finding of Adverse Effect for the Revolution Wind Farm and Revolution Wind Export Cable Construction and Operations Plan

August 2022

U.S. Department of the Interior
Bureau of Ocean Energy Management
Sterling, Virginia

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List of Abbreviations

ACHP	Advisory Council on Historic Preservation
ADLS	aircraft detection lighting system
APE	area of potential effects
ASLF	ancient submerged landform
BOEM	Bureau of Ocean Energy Management
B.P.	before present
bsb	below seabed
ca.	circa
CATEX	Categorical Exclusion
CHRVEA	Cumulative Historic Resources Visual Effects Analysis
confidential	contains material that meets the criteria for confidentiality under Section 304 of the NHPA
CT	Connecticut
EA	Environmental Assessment
EIS	environmental impact statement
Finding	Finding of Effect
FONSI	Finding of No Significant Impact
GIS	geographic information system
HDD	horizontal directional drilling
HRVEA	Historic Resources Visual Effects Analysis
IAC	inter-array cable
ICF	interconnection facility
MA	Massachusetts
MARA	Marine Archaeological Resources Assessment
MHC	Massachusetts Historical Commission
MOA	memorandum of agreement
MW	megawatt
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NOI	notice of intent
NPS	National Park Service
NRHP	National Register of Historic Places
NY	New York
O&M	operations and maintenance
OCS	Outer Continental Shelf
OnSS	onshore substation
OSS	offshore substation
PA	programmatic agreement
PAL	Public Archaeology Laboratory, Inc.

PDE	project design envelope
PPAs	power purchase agreements
RI	Rhode Island
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
RI/MA WEA	Rhode Island/Massachusetts Wind Energy Area
ROD	Record of Decision
RODA	Responsible Offshore Development Alliance
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
SAP	Site Assessment Plan
SHPO	State Historic Preservation Officer
SWCA	SWCA Environmental Consultants
TARA	Terrestrial Archaeological Resources Assessment
TCP	Traditional Cultural Property
TNEC	The Narragansett Electric Company
Tribal Nation	Federally-recognized Indian Tribe
vhb	Vanasse Hangen Brustlin, Inc.
VIA	Visual Impact Assessment
WTG	wind turbine generator

1 Introduction

The Bureau of Ocean Energy Management (BOEM) is reviewing the construction and operations plan (COP) prepared by Vanasse Hangen Brustlin, Inc. (vhb) (2021) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) Project (the Project). The RWF is located in the Rhode Island-Massachusetts Wind Energy Area (RI/MA WEA) and the RWEC connects to Rhode Island (RI).

BOEM has made a Finding of Adverse Effect (Finding) for the Project pursuant to Section 106 of the National Historic Preservation Act (NHPA) (54 USC 306108), the implementing regulations for the Section 106 process ("Protection of Historic Properties" 36 CFR Part 800). BOEM has determined the Project will adversely affect National Historic Landmarks (NHLs) and, in compliance with Section 110(f) of the NHPA (54 USC 306107)BOEM, to the maximum extent possible conducted early planning and actions as may be necessary to minimize harm to the NHLs. This Finding documents potential effects to historic properties in marine, terrestrial, and above ground historical contexts including the NHLs. As defined in 36 CFR 800.16(l)(1), "Historic property means any prehistoric [or pre-contact] or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP] maintained by the Secretary of the Interior." The term historic property includes all NHLs as well as properties of traditional religious and cultural importance to Tribal Nations that are eligible for NRHP listing (36 CFR 800.16(l)(1)). Historic properties include "properties formally determined as such in accordance with regulations [in 36 CFR 63] of the Secretary of the Interior and all other properties that meet the National Register criteria" (36 CFR 800.16(l)(2)).

1.1 Marine Cultural Resources

In the COP, Revolution Wind, LLC (Revolution Wind) has identified 29 marine cultural resources in the Project's area of potential effects (APE) that are of archaeological interest. Based on potential connections to significant historical events and on the important information these resources could provide, BOEM is treating these 29 resources as eligible for listing in the NRHP and, therefore, as historic properties. These marine cultural resources consist of 19 potential submerged archaeological marine resources, designated as shipwrecks/possible historic shipwrecks; although, they may also include other sunken crafts and structures. The 29 resources further consist of 10 geomorphic features, also referred to as ancient submerged landforms (ASLFs), that are of importance to Tribal Nations as well as being of potential archaeological significance. The COP indicates that all 19 shipwrecks/possible historic shipwrecks would be avoided with sufficient buffers by all proposed activities that are part of the Project and, as a result, there would be no effects to these potential historic properties (SEARCH, Inc. [SEARCH] 2022). Nine of the 10 ASLFs on the Outer Continental Shelf (OCS) and in RI state waters (Table 1) are not fully avoidable by physical disturbance from Project construction activities and, as a result, BOEM has determined these nine would be adversely affected.

Table 1. Historic Properties, Consisting of Ancient Submerged Landforms (Geomorphic Features), Adversely Affected by the Project

Geomorphic Feature ID	Location	Description
Target-21	RWEC (RI)	[redacted]
Target-22	RWEC (RI)	[redacted]

Geomorphic Feature ID	Location	Description
Target-23	RWEC (OCS)	[redacted]
Target-24	RWF (OCS)	[redacted]
Target-25	RWF (OCS)	[redacted]
Target-26	RWF (OCS)	[redacted]
Target-28	RWF (OCS)	[redacted]
Target-29	RWEC (RI)	[redacted]
Target-30	RWEC (RI)	[redacted]

Source: SEARCH (2022:Table 4-2). Mapped ASLF extents and locations (SEARCH 2022) contain material that meets the criteria for confidentiality under Section 304 of the NHPA and are not publicly distributed.

1.2 Terrestrial Cultural Resources

In the COP, Revolution Wind identified four archaeological sites not fully avoidable in the construction of onshore Project components. BOEM has determined that two of the archaeological sites (Table 2) are historic properties and would be adversely affected by onshore substation (OnSS) development.

Table 2. Historic Properties, Consisting of Terrestrial Cultural Resources, Adversely Affected by the Project

Terrestrial Cultural Resources	Portion of Project	Description
[redacted] #1	[redacted]	[redacted] Archaeological
[redacted] #2	[redacted]	[redacted] Archaeological

Source: Forrest and Waller (2021)

1.3 Above Ground Historic Properties

In the COP, the offshore Historic Resources Visual Effects Analysis (HRVEA) (EDR 2022a; 2022b) identified 451 above ground historic properties in the APE. The onshore HRVEA (EDR 2021a) identified 80 above ground historic properties and found two of these to be in the APE. Quonset Pont Historic Naval Air station was addressed in both HRVEAs (EDR 2021a, 2022a). The above ground historic properties range from individual structures to complex sites, historic districts, and Traditional Cultural Properties (TCPs) that are within the viewshed of offshore and onshore Project facilities. BOEM has determined that offshore Project facilities would adversely affect 101 historic properties in RI and Massachusetts (MA) (Table 3) by introducing visual impacts from the Project wind turbine generators (WTGs) and offshore substations (OSSs).

Table 3. Above Ground Historic Properties Adversely Affected by the Project, in Order of Nearest Distance to Project WTGs

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
TCP-3	[redacted] TCP	[redacted]	[redacted]	MA	NRHP-eligible (BOEM determined)	6*
300	Sakonnet Light Station	Little Compton	Newport	RI	NRHP-listed resource	12.7

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
297	Warren Point Historic District	Little Compton	Newport	RI	NRHP-eligible resource (RIHPHC determined)	12.9
299	Abbott Phillips House	Little Compton	Newport	RI	RIHPHC historic resource	13
504	Flaghole	Chilmark	Dukes	MA	MHC historic inventory site	13.3
296	Stone House Inn	Little Compton	Newport	RI	NRHP-listed resource	13.4
503	Simon Mayhew House	Chilmark	Dukes	MA	MHC historic inventory site	13.5
474	Flanders, Ernest House, Shop, Barn	Aquinnah	Dukes	MA	MHC historic inventory site	13.8
496	71 Moshup Trail	Aquinnah	Dukes	MA	MHC historic inventory site	13.7
484	Vanderhoop, Edwin DeVries Homestead	Aquinnah	Dukes	MA	NRHP-listed resource	13.7
480	Gay Head - Aquinnah Shops Area	Aquinnah	Dukes	MA	MHC historic inventory site	13.7
495	3 Windy Hill Drive	Aquinnah	Dukes	MA	MHC historic inventory site	13.9
479	Gay Head Light	Aquinnah	Dukes	MA	NRHP-listed resource	13.9
485	Tom Cooper House	Aquinnah	Dukes	MA	MHC historic inventory site	14
497	Leonard Vanderhoop House	Aquinnah	Dukes	MA	MHC historic inventory site	14
490	Theodore Haskins House	Aquinnah	Dukes	MA	MHC historic inventory site	14.1
486	Gay Head - Aquinnah Coast Guard Station Barracks	Aquinnah	Dukes	MA	MHC historic inventory site	14.1
491	Gay Head - Aquinnah Town Center Historic District	Aquinnah	Dukes	MA	NRHP-listed resource	14.2
303	Gooseneck Causeway	Westport	Bristol	MA	MHC historic inventory site	14.8
304	Gooseberry Neck Observation Towers	Westport	Bristol	MA	MHC historic inventory site	14.8
540	Spring Street	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	14.9
590	Capt. Mark L. Potter House	New Shoreham	Washington	RI	RIHPHC historic resource	14.9
276	Tunipus Goosewing Farm	Little Compton	Newport	RI	NRHP-Eligible Resource (RIHPHC Determined)	15
543	WWII Lookout Tower – Spring Street	New Shoreham	Washington	RI	NRHP-Eligible Resource (RIHPHC Determined)	15.1
251	Westport Harbor	Westport	Bristol	MA	MHC historic inventory site	15.2
290	Bellevue Avenue Historic District NHL	Newport	Newport	RI	NHL	15.2
548	Block Island Southeast Light	New Shoreham	Washington	RI	NHL	15.2
595	New Shoreham Historic District	New Shoreham	Washington	RI	Local Historic	15.3
536	Spring Cottage	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
531	Old Harbor Historic District	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC-determined)	15.3
538	Captain Welcome Dodge Sr.	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
541	Caleb W. Dodge Jr. House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
535	Spring House Hotel	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.4

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
545	Pilot Hill Road and Seaweed Lane	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.4
222	Ocean Drive Historic District NHL	Newport	Newport	RI	NHL	15.7
298	Marble House NHL	Newport	Newport	RI	NHL	15.7
597	Ochre Point – Cliffs Historic District	Newport	Newport	RI	NRHP-listed resource	15.8
546	WWII Lookout Tower at Sands Pond	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.8
552	Sea View Villa	Middletown	Newport	RI	RIHPHC historic resource	15.9
295	Rosecliff/Oelrichs (Hermann) House/ Mondroe (J. Edgar) House	Newport	Newport	RI	NRHP-listed resource	15.9
293	The Breakers NHL	Newport	Newport	RI	NHL	15.9
516	Corn Neck Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.9
302	Clam Shack Restaurant	Westport	Bristol	MA	MHC historic inventory site	15.9
301	Horseneck Point Lifesaving Station	Westport	Bristol	MA	MHC historic inventory site	15.9
553	Whetstone	Middletown	Newport	RI	RIHPHC historic resource	16
284	The Bluff/John Bancroft Estate	Middletown	Newport	RI	RIHPHC historic resource	16
288	Clambake Club of Newport	Middletown	Newport	RI	NRHP-listed resource	16
530	Old Town and Center Roads	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16
526	Beach Avenue	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.1
519	Mitchell Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.1
523	Indian Head Neck Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.2
168	Westport Pt. Revolutionary War Properties	Westport	Bristol	MA	MHC historic inventory site	16.2
261	Indian Avenue Historic District	Middletown	Newport	RI	NRHP-listed resource	16.2
278	St. Georges School	Middletown	Newport	RI	NRHP-listed resource	16.3
528	Hygeia House	New Shoreham	Washington	RI	NRHP-listed resource	16.3
527	U.S. Weather Bureau Station	New Shoreham	Washington	RI	NRHP-listed resource	16.3
549	Miss Abby E. Vaill/1 of 2 Vaill cottages	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.4
550	Hon. Julius Deming Perkins / ”Bayberry Lodge”	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.4
542	Lakeside Drive and Mitchell Lane	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.5
280	Land Trust Cottages	Middletown	Newport	RI	NRHP-eligible resource (RIHPHC determined)	16.6
482	Russell Hancock House	Chilmark	Dukes	MA	MHC historic inventory site	16.6
163	Westport Point Historic District (1 of 2)	Westport	Bristol	MA	NRHP-eligible resource (MHC determined)	16.7

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
164	Westport Point Historic District (2 of 2)	Westport	Bristol	MA	NRHP-listed resource	16.7
551	Mohegan Cottage/Everett D. Barlow House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.7
266	Paradise Rocks Historic District	Middletown	Newport	RI	RIHPHC historic resource	16.8
547	Lewis- Dickens Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.8
525	Island Cemetery/Old Burial Ground	New Shoreham	Washington	RI	RI Historical Cemetery	16.8
279	Kay St.-Catherine St.-Old Beach Rd. Historic District/The Hill	Newport	Newport	RI	NRHP-listed resource	16.9
532	Beacon Hill Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.9
533	Nathan Mott Park	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.9
515	Block Island North Lighthouse	New Shoreham	Washington	RI	NRHP-listed resource	17.1
522	Champlin Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.1
517	Hippocampus/Boy’s Camp/ Beane Family	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.2
520	U.S. Lifesaving Station	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.4
518	U.S. Coast Guard Brick House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.4
521	Peleg Champlin House	New Shoreham	Washington	RI	NRHP-listed resource	17.5
469	Hancock, Captain Samuel - Mitchell, Captain West House	Chilmark	Dukes	MA	NRHP-eligible resource (MHC determined)	17.6
508	Scrubby Neck Schoolhouse	West Tisbury	Dukes	MA	MHC historic inventory site	18
345	Point Judith Lighthouse	Narragansett	Washington	RI	NRHP-listed resource	18.2
245	Bailey Farm	Middletown	Newport	RI	NRHP-listed resource	18.3
226	Beavertail Light	Jamestown	Newport	RI	NRHP-listed resource	18.4
582	Horsehead/Marbella	Jamestown	Newport	RI	NRHP-listed resource	18.6
333	Ocean Road Historic District	Narragansett	Washington	RI	NRHP-listed resource	18.9
335	Dunmere	Narragansett	Washington	RI	NRHP-listed resource	19.1
86	Puncatest Neck Historic District	Tiverton	Newport	RI	RIHPHC historic resource	19.4
576	Fort Varnum/Camp Varnum	Narragansett	Washington	RI	NRHP-eligible resource (RIHPHC determined)	19.6
156	Salters Point	Dartmouth	Bristol	MA	MHC historic inventory site	19.7
578	Dunes Club	Narragansett	Washington	RI	NRHP-listed resource	19.8
329	Life Saving Station at Narragansett Pier	Narragansett	Washington	RI	NRHP-listed resource	19.8
330	The Towers Historic District	Narragansett	Washington	RI	NRHP-listed resource	19.8
591	Narragansett Pier MRA	Narragansett	Washington	RI	NRHP-listed resource	19.8
328	The Towers/Tower Entrance of Narragansett Casino	Narragansett	Washington	RI	NRHP-listed resource	19.9

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
TCP-1	[redacted]	[redacted]	[redacted]	MA	NRHP-eligible resource (BOEM determined)	20
343	Brownings Beach Historic District	South Kingstown	Washington	RI	NRHP-listed resource	21.8
444	Tarpaulin Cove Light	Gosnold	Dukes	MA	NRHP-listed resource	22.2
391	Clark's Point Light	New Bedford	Bristol	MA	NRHP-listed resource	24.6
390	Fort Rodman Historic District	New Bedford	Bristol	MA	NRHP-eligible resource (MHC determined)	24.6
392	Fort Taber Historic District	New Bedford	Bristol	MA	NRHP-listed resource	24.6
386	Butler Flats Light Station	New Bedford	Bristol	MA	NRHP-listed resource	25.6
389	744 Sconticut Neck Road	Fairhaven	Bristol	MA	MHC historic inventory site	25.9
449	Nobska Point Lighthouse	Falmouth	Barnstable	MA	NRHP-listed resource	28

Source: EDR (2022a:Attachment A)

Notes: MHC = Massachusetts Historical Commission, RIHPC = Rhode Island Historical Preservation & Heritage Commission.

* This TCP extends for several miles offshore, including within 6 miles of the nearest potential Project WTG offshore [redacted].

2 Project Overview

On March 13, 2020, BOEM received the initial COP to develop a wind energy project within BOEM Renewable Energy Lease Area OCS-A 0486 (Lease Area) from Revolution Wind. In the revised version of the COP (submitted in December 2021), Revolution Wind proposes the construction, operations, and eventual decommissioning of the Project, with up to 100 WTGs, up to two OSSs, inter-array cables (IACs) buried under the seafloor linking the individual WTGs to the OSS, one OSS-link cable under the seafloor linking the OSSs to each other, up to two offshore sub-seafloor export cables, a 3.1-acre landfall work area for the export cables to come ashore at Quonset Point, a buried onshore transmission cable system, up to one OnSS and adjacent interconnection facility (ICF) with a buried connection line, and an overhead connection from the ICF to The Narragansett Electric Company's (TNEC) existing Davisville Substation (and the electrical grid in RI) (Figures A-1 and A-2 in Appendix A [vhb 2021:Figures ES-1 and ES-2]). Revolution Wind is utilizing a project design envelope (PDE) in its COP, which represents a range of design parameters that could be used for the Project. In reviewing the PDE, BOEM is analyzing the maximum impacting scenario (or maximum-case scenario) that could occur from any combination of the Project parameters. BOEM's analysis and review of the PDE could result in the approval of a project that is constructed within that range or a subset of design parameters within the proposed range.

For the RWF, as proposed in Revolution Wind's COP, each of the up to 100 WTGs would have a nameplate capacity of 8 to 12 megawatts (MW)[1]. The WTGs, OSSs, IACs, and OSS-link cable would be located in the Lease Area approximately 13 nautical miles (nm) (approximately 15 miles) east of Block Island, RI, and approximately 15 nm (approximately 17.25 miles) southeast of the coast of mainland RI. The RWEC would be buried in the seabed within federal OCS and RI state waters. The onshore transmission cabling, OnSS, ICF, and one grid connection would be located in Washington County, RI.

2.1 Background

The RWF is located within the RI/MA WEA where BOEM has conducted previous Section 106 reviews for issuance of the commercial lease and approval of site assessment activities. The Section 106 process was completed through a programmatic agreement (PA)[2] executed June 8, 2012 (BOEM 2012a), prepared concurrently with the BOEM's environmental assessment (EA) for commercial wind lease issuance and site assessment activities on the Atlantic OCS offshore RI and MA (BOEM 2012b, 2013). A commercial lease sale for the RI/MA was held in 2013 and Revolution Wind was the winner of Lease OCS-A 0486 (under its current number designation). Subsequent to award of the lease, Revolution Wind submitted a site assessment plan (SAP) describing the proposed construction and installation, operations and maintenance (O&M), and decommissioning of a stand-alone offshore meteorological data collection

[1] BOEM's EIS also analyzes an alternative that, if selected, would implement a higher nameplate capacity WTG (up to 14 MW assumed for the analysis) than what is in the COP project design envelope. This higher capacity WTG, however, must still fall within the physical design parameters of the PDE and thus within the maximum case design parameters used for evaluating impacts in the EIS and this Finding. It is important to note, however, that under this alternative less than 100 WTGs would be approved and installed, potentially reducing some of the impacts described in this Finding depending on which WTG positions were to be removed.

[2] *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*

system (Tetra Tech 2016), which BOEM reviewed and approved (BOEM 2017). Section 106 reviews for both the lease issuance and the approval of the SAP were conducted pursuant to the PA (BOEM 2012a). These reviews concluded with a BOEM determination of no historic properties affected for lease issuance, corresponding to the finding of no significant impact (FONSI), consequent to EA finalization on June 4, 2013. NEPA review of the SAP for categorical exclusion (CATEX) documented BOEM's finding of no historic properties affected under Stipulation 1 of the PA, on September 21, 2016 (and for consequent SAP approval on October 12, 2017).

2.2 Undertaking

BOEM has determined that the construction, operation, maintenance, and eventual decommissioning of the Project is the undertaking subject to Section 106 and that the activities proposed in 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/revolution-wind-farm-construction-and-operations-plan-april-2021). BOEM sent to all consulting parties on February 28, 2022, those appendices to the COP that identify cultural resources and assess historic properties, and on August 1, 2022 BOEM sent revised versions of these documents. These documents contain material that meets the criteria for confidentiality under Section 304 of the NHPA. The COP, as well as its public and confidential appendices on cultural resources, is hereby incorporated by reference into this Finding.

BOEM has elected to use NEPA substitution for the Section 106 review pursuant to 36 CFR 800.8(c) (see also Advisory Council on Historic Preservation [ACHP} 2020; Council on Environmental Quality and ACHP 2013). BOEM's Section 106 review for this undertaking includes the identification and evaluation of historic properties and the assessment of effects for all the action alternatives identified during the NEPA review, in the draft environmental impact statement (EIS) for the Project (BOEM 2022a). The EIS analyzes the impacts of the Project to the human environment and specifically to cultural resources, including historic properties. The NEPA EIS and Section 106 review analyze a total of 13 alternatives (A through F including their variants [C1, C2, D1–D3, E1, and E2]), as presented in Table 4.

Table 4. Description of the Alternatives Reviewed in the Environmental Impact Statement

Alternative	Description
A: No Action Alternative	The COP would not be approved, and the proposed construction and installation, O&M, and eventual decommissioning activities would not occur.
B: Proposed Action Alternative (Proposed Action)	The construction and installation, O&M, and eventual decommissioning of a wind energy facility within the PDE and applicable mitigation measures, as described in the COP. The Proposed Action includes up to 100 WTGs ranging in nameplate capacity of 8 to 12 MW sufficient to fulfill at a minimum the existing power purchase agreements (PPAs, totaling 704 MW) and up to 880 MW, the maximum capacity identified in the PDE. The WTGs will be connected by a network of IACs; up to two offshore substations (OSSs)[3] connected by an offshore substation-link cable; up to two submarine export cables co-located within a single corridor; up to two underground

[3] Each OSS has a maximum nominal capacity of 440 MW; two OSSs are required to achieve the PPA obligations of 704 MW.

	transmission circuits located onshore; and an onshore substation inclusive of up to two interconnection circuits connecting to the existing Davisville Substation in North Kingstown, RI. The Proposed Action includes the burial of offshore export cables below the seabed in both the OCS and RI state waters and a uniform east-west and north-south grid of 1 × 1–nm spacing between WTGs.
C: Habitat Impact Minimization Alternative	The construction and installation, O&M, and eventual decommissioning of a wind energy facility within the PDE and applicable mitigation measures, as described in the COP. To reduce impacts to complex fisheries habitats most vulnerable to permanent and long-term impacts from the Proposed Action, however, certain WTG positions would be omitted while maintaining a uniform east-west and north-south grid of 1 × 1–nm spacing between WTGs. The placement of WTGs would be supported by location-specific benthic and habitat characterizations conducted in close coordination with NMFS. Under this alternative, fewer WTG locations (and potentially fewer miles of IACs) than proposed by the lessee would be approved by BOEM. Under this alternative, BOEM could select one of the following alternatives: • Alternative C1: This alternative allows for the fulfillment of the existing three PPAs, which total 704 MW, while omitting WTGs in locations where micrositing is not possible to maintain a uniform east–west/north–south grid of 1 × 1–nm spacing between WTGs. Under this alternative, up to 65 WTGs would be approved. • Alternative C2: This alternative allows for the fulfillment of the existing three PPAs, which total 704 MW, while omitting WTGs in locations where micrositing is not possible to maintain a uniform east west and north-south grid of 1 × 1–nm spacing between WTGs. Under this alternative, up to 64 WTGs would be approved. Refer to draft EIS Appendix K for background information on the development of the Alternative C1 and C2 layouts.
D: No Surface Occupancy in One or More Outermost Portions of the Project Area Alternative	The construction and installation, O&M, and eventual decommissioning of a wind energy facility within the PDE and applicable mitigation measures, as described in the COP. However, to reduce conflicts with other competing space-use vessels, WTGs adjacent to or overlapping transit lanes proposed by stakeholders or the Buzzard's Bay Traffic Separation Scheme Inbound Lane, would be eliminated while maintaining the uniform east-west and north-south 1 × 1–nm grid spacing between WTGs. Under this alternative, BOEM could select one, all, or a combination of the following three alternatives, while still allowing for the fulfillment of existing PPAs and up to the maximum capacity identified in the PDE (i.e., 880 MW). • Alternative D1: Removal of the southernmost row of WTGs that overlap the 4-nm east-west transit lane proposed by the Responsible Offshore Development Alliance (RODA), as well as portions of Cox Ledge. Selecting this alternative would remove up to seven WTG positions and associated IACs from consideration. • Alternative D2: Removal of the eight easternmost WTGs that overlap the 4-nm north-south transit lane proposed by RODA. Selecting this alternative would remove up to eight WTG positions and associated IACs from consideration. • Alternative D3: Removal of the northwest row of WTGs adjacent to the Inbound Buzzards Bay Traffic Lane. Selecting this alternative would remove up to seven WTG positions and associated IACs.

	The selection of all three alternatives (i.e., D1, D2, and D3) would eliminate up to a total of 22 WTG locations and associated IACs while maintaining the 1 × 1–nm grid spacing proposed in the COP and as described in Alternative B. Based on the design parameters outlined in the COP, allowing for the placement of 78 to 93 WTGs and two OSSs would still allow for the fulfillment of up to the maximum capacity identified in the PDE (e.g., 880 MW = 74 WTGs needed if 12 MW WTGs are used).
E: Reduction of Surface Occupancy to Reduce Impacts to Culturally-Significant Resources Alternative	The construction and installation, O&M, and eventual decommissioning of a wind energy facility within the PDE and applicable mitigation measures, as described in the COP. However, to reduce the visual impacts on culturally important resources on Martha's Vineyard and in RI, some WTG positions would be eliminated while maintaining the uniform east-west and north-south 1 × 1–nm grid spacing between WTGs. • Alternative E1: Allows for the fulfillment of the existing three PPAs totaling 704 MW, while eliminating WTG locations to reduce visual impacts on these culturally-important resources. Under this alternative, up to 64 WTG positions would be approved. • Alternative E2: Allows for a power output delivery identified in the PDE of up to 880 MW while eliminating WTG locations to reduce visual impacts on these culturally-important resources. Under this alternative, up to 81 WTG positions would be approved. Refer to draft EIS Appendix K for background information on the development of the Alternative E1 and E2 layouts.
F: Selection of a Higher Capacity Wind Turbine Generator	The construction and installation, O&M, and eventual decommissioning of a wind energy facility implementing a higher nameplate capacity WTG (up to 14 MW) than what is proposed in the COP. This higher capacity WTG must fall within the physical design parameters of the PDE and be commercially available to the Project proponent within the time frame for the construction and installation schedule proposed in the COP. The number of WTG locations under this alternative would be sufficient to fulfill the minimum existing PPAs (total of 704 MW and 56 WTGs, including up to five "spare" WTG locations). Using a higher capacity WTG would potentially reduce the number of foundations constructed to meet the purpose and need and thereby potentially reduce impacts to marine habitats and culturally significant resources and potentially reduce navigation risks.

Source: BOEM (2022a:Table 2.1-1)

2.3 Area of Potential Effects

The geographic analysis area, as described for potential impacts to cultural resources (marine, terrestrial, and above ground) in the EIS under NEPA is equivalent to the Project's APE, as defined in the Section 106 regulations. In 36 CFR 800.16(d), the APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alteration in the character or use of historic properties, if any such properties exist." BOEM (2020) defines the Project APE as follows:

- the depth and breadth of the seafloor potentially affected by any bottom-disturbing activities, constituting the marine cultural resources portion of the APE;
- the depth and breadth of terrestrial areas potentially affected by any ground-disturbing activities, constituting the terrestrial cultural resources portion of the APE;

- the viewshed from which renewable energy structures, whether located offshore or onshore, would be visible, constituting the APE for visual impacts analysis; and
- any temporary or permanent construction or staging areas, both onshore and offshore.

This Finding assesses effects only to historic properties within the APE for the Project. These effects include reasonably foreseeable effects caused by the Project that could occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5(a)(1)).

2.3.1 Marine Area of Potential Effects

BOEM (2020) defines the APE for marine cultural resources (hereafter marine APE) as the depth and breadth of the seafloor potentially impacted by bottom-disturbing activities of the Project (Figure A-1 in Appendix A) (SEARCH 2022).

2.3.1.1 Revolution Wind Farm Maximum Work Area

The marine APE encompasses all offshore areas where seafloor-disturbing activities from WTG and OSS foundation construction IAC trenching and installation, boulder relocation, and vessel anchoring could occur. The RWF COP PDE proposes up to 100 WTGs and two OSSs within the extent of the APE. Each potential WTG and OSS foundation location includes up to approximately 3-acres of seafloor disturbance under the maximum-case scenario, for a combined total of approximately 734 acres of horizontal construction disturbance for up to 102 offshore Project foundations, reaching up to a maximum vertical extent of 164 feet below seabed (bsb) for monopile foundations (BOEM 2022a). Under the maximum-case scenario up to 164 miles of IAC and OSS-link cable would be installed, resulting in up to 2,619 acres of seafloor disturbance and reaching cable emplacement depths of up to 10 feet below seafloor (BOEM 2022a). The target IAC and OSS-link cable burial depth requirement for the Project is 4 to 6 feet bsb.

2.3.1.2 Revolution Wind Farm Export Cable Offshore Corridor

The RWEC would span approximately 42 miles through federal waters and RI state waters with landfall near Quonset Point, RI (BOEM 2022a). Combined, the two parallel cables' length would be approximately 84 miles. The RWEC crosses the would span 19 miles of the OCS and 23 miles through RI state waters before reaching landfall (BOEM 2022a). The entire RWEC will be located within a 1,640-foot-wide Project easement (8,349 acres) with the maximum depth of impact extending 13 feet (4 m) below the seafloor (BOEM 2022a). The target RWEC burial depth requirement for the Project is 4 to 6 feet bsb. The maximum-case scenario for horizontal seafloor disturbance of the RWEC would be 1,390 acres of the 8,349 acre-corridor (BOEM 2022a). At the landfall work area, the marine APE also includes workspaces where potential seafloor-disturbing activities associated with horizontal directional drilling (HDD), potentially involving use of an offshore cofferdam, and vessel anchoring could occur. Details of the onshore transition for the RWEC is described with the landfall envelope in Section 2.3.2.1.

2.3.1.3 Offshore Vessel Anchoring

Vessel anchoring for RWF and RWEC construction, operations, maintenance, and decommissioning would disturb up to 3,178 acres of seafloor under the maximum-case scenario (BOEM 2022a). Anchors for cable-laying vessels have a maximum penetration depth of 15 feet (BOEM 2022a). Anchoring would be limited to the RWF maximum work area and the RWEC corridor (see Figure B-1).

2.3.2 Terrestrial Area of Potential Effects

BOEM (2020) defines the APE for terrestrial cultural resources (hereafter terrestrial APE) as the depth and breadth of terrestrial areas potentially impacted by any ground-disturbing activities of the Project. This includes the areas of the landfall envelope, onshore transmission cable easement, OnSS, and ICF depicted in Figure A-2.

2.3.2.1 Landfall Envelope

Revolution Wind is considering a range of siting options for the RWEC landfall, all of which are encompassed by a 20-acre landfall work area. Within this area, 3.1 acres would be sited, within which ground disturbance associated with the onshore transmission cable construction would occur. The deepest disturbances within the landfall work area would be associated with the HDD construction method for cable emplacement, which could entail the installation of temporary sheet pile anchor walls driven to a depth of approximately 20 feet. The HDD drill itself could reach a depth of up to 66 feet below the seafloor and between the onshore transition joint bays and the offshore exit pits. HDD sediment displacement would be largely confined to the two 3-foot-diameter bore holes.

2.3.2.2 Onshore Transmission Cabling

The width of potential ground disturbance for the onshore transmission cable is assumed to be at the extent of the Project easement, which is 25 feet wide centered along the cable route. The preferred onshore transmission cable route from the landfall location to the OnSS is an approximately 1-mile route that will predominantly follow along paved roads or previously disturbed areas such as parking lots. There are alternative onshore transmission cable routes under consideration within the onshore transmission cable PDE, as depicted on Figure A-2. The maximum-scenario for onshore cable disturbance is 16.7 acres. Although some of the alternative routes under consideration have segments that would be installed in undeveloped vegetated areas, these alternates would mostly be installed within paved roads and parking lots (as with the preferred onshore transmission cable route) and would be approximately the same length. Project-related ground disturbance could extend to a maximum depth of 13 feet below ground level anywhere within the width of this easement. Installation of the onshore transmission cable will impact approximately 3.1 acres; therefore, only a portion of the 16.7-acre onshore transmission cable envelope will actually be impacted by installation of the onshore transmission cable.

2.3.2.3 Onshore Substation and Interconnection Facility

Construction of the OnSS and ICF would together require disturbance of approximately 11 acres within the terrestrial APE (BOEM 2022a). The maximum depth of disturbance within the OnSS and ICF work area limit is 60 feet below ground surface. The OnSS and ICF would have an underground cable connecting them and the ICF would have an overhead cable connecting to the adjacent, existing TNEC Davisville substation.

2.3.3 Visual Area of Potential Effects

The APE for potential visual effects (hereafter visual APE) from the Project consists of onshore coastal areas of Connecticut (CT), New York (NY), RI, and MA. Maximum limits of theoretical visibility are represented by 1-mile, 3-mile, and 40-mile radii for each respective onshore or offshore Project component (WTG, OSS, OnSS, ICF, or O&M facility); however, these radii do not define the visual APE. Within these radii, the visual APE is defined only by those geographic areas with a potential visibility of Project components and, therefore, the visual APE excludes areas with obstructed views of Project components. Visibility and views of Project components were determined through a viewshed analysis (EDR 2021a, 2021b, 2021c, 2022a). The viewshed analysis applied geographic information system (GIS) modeling to take into account the true visibility of the Project (e.g., visual barriers such as topography, vegetation, and intervening structures that obstruct the visibility of Project components).

Areas with potentially unobstructed views of offshore Project components comprise the APE for above ground historic properties (visual APE); see the shaded visual APE (Offshore Facility Viewshed) and visual APE (Onshore Facility Viewshed) areas in Figures A-3 and A-4. Figure A-4 also depicts reasonably foreseeable future project areas for consideration of cumulative effects within the visual APE.

2.3.3.1 Onshore Project Components

Onshore Project facilities with above ground components include the OnSS and ICF, and these components have a viewshed radius of 3 miles. Onshore Project components where redevelopment of existing facilities could occur (O&M facilities) have a viewshed radius of 1 mile around and include potential O&M facilities at the Port of Davisville at Quonset Point and Port Robinson. The 1-mile radius at the Port of Davisville at Quonset Point O&M facility is completely subsumed within the 3-mile radius around the ICF and OnSS (Figure A-3).

The horizontal extent of the OnSS and ICF, as described under the terrestrial APE at Section 2.3.2.3, would be within an 11-acre area of disturbance. The maximum height of OnSS and ICF equipment would be up to 45 feet above ground, with OnSS shielding masts extending further, up to 65 feet, and the ICF overhead transmission circuit structures reaching up to 80 feet above ground (BOEM 2022a). Facility lighting was considered in the analysis of visual effects.

2.3.3.2 Offshore Project Components

Offshore Project components (e.g., WTGs) have a viewshed radius of 40 miles around the edge of the Lease Area (Figure A-4). The Project [redacted] extends to above ground historic properties in the following cities and towns (EDR 2022a):

- RI—Bristol, Charlestown, Cranston, East Greenwich, Exeter, Jamestown, Little Compton, Middletown, Narragansett, New Shoreham, Newport, North Kingstown, Portsmouth, South Kingstown, Tiverton, Warwick, and Westerly;
- MA—Acushnet, Aquinnah, Barnstable, Bourne, Chilmark, Dartmouth, Edgartown, Fairhaven, Fall River, Falmouth, Gosnold, Marion, Mattapoisett, Nantucket, New Bedford, Swansea, Tisbury, Wareham, West Tisbury, and Westport;
- NY—East Hampton and Southold; and
- CT—Groton.

Above ground historic property distribution in the visual APE is mapped on Figure A-4. APE delineation and historic property identification assessed the potential visibility of a WTG from the water level to the tip of an upright rotor blade at a height of 873 feet and further considered how distance and curvature of the Earth affect visibility as space between the viewing point and WTGs increases (EDR 2021c, 2022a). Potential WTG and OSS locations and spacing in the Project Lease Area also informed analyses, including when combined with the cumulative development of other reasonably foreseeable offshore wind developments (EDR 2021b). The analysis further considered the nighttime lighting of offshore structures and construction lighting.

3 Steps Taken to Identify Historic Properties

3.1 Technical Reports

To support the identification of historic properties within the APE, Revolution Wind has provided survey reports detailing the results of multiple investigations within the APE (marine, terrestrial, and visual). Table 5 provides a summary of these efforts to identify historic properties and the key findings/recommendations of each investigation. BOEM has reviewed and accepted all reports summarized in Table 5. BOEM found that the preliminary APE identified by Revolution Wind are appropriate for the magnitude, extent, location, and nature of the undertaking; that the reports collectively represent a good faith effort to identify historic properties within the APE; and that the reports are sufficient to apply the Criteria of Adverse Effect (see Section 4) and to continue consultations with consulting parties for taking into account and resolving adverse effects to historic properties.

3.1.1 Report Summary – Marine

The Marine Archaeological Resources Assessment (MARA) provides the results of the archaeological survey of the seafloor and seabed within the marine APE for historic properties, largely represented by ASLFs and shipwrecks/possible historic shipwrecks. ASLFs represent submerged lands—ancestral lands to today's Tribal Nations—that were inundated by approximately 8,000 years before present (B.P.), with submersion taking several thousand years at the beginning of the Holocene epoch, following the last ice age. Shipwrecks and similar submerged craft or structures of the type found to date were sank within the past 400 years, after European colonization of New England. Historic properties (shipwrecks/possible historic shipwrecks and ASLFs) located in the marine APE in the RWF Lease Area and the RWEC corridor are depicted in Appendix B (Figure B-1) (SEARCH 2022:Figure 4-1). Appendix B contains sensitive historic property location information that meet the criteria for confidentiality under Section 304 of the NHPA and, for this reason, is detached from the publicly available copies of the Finding.

3.1.2 Report Summary – Terrestrial

The Terrestrial Archaeological Resources Assessment (TARA) provides the results of land-surface and subsurface-onshore archaeological survey (Phase I archaeological survey) of the terrestrial APE. The RWEC would transition from sea to shore at Quonset Point in RI. Quonset Point is in an area [redacted] extending to the west and southwest of the terrestrial APE (Forrest and Waller 2021). However, construction, operations, decommissioning, and large-scale redevelopment of former military facilities at Quonset Point following World War II has substantially altered the terrestrial APE. Intact pockets of natural soils represent a small percentage of all surficial earth. The proposed OnSS site was used as a general dump site during naval operations (1940s through 1960s); several hundred tons of debris and soil were removed from this dump site during remediation activities in the late 1990s. The pockets of relatively intact natural soils within the terrestrial APE are located within [redacted] work area limits and along the southern margins of the landfall area (Forrest and Waller 2021).

The Public Archaeology Laboratory, Inc. (PAL) contacted the RIHPHC and the Narragansett Indian Tribe, Wampanoag Tribe of Gay Head (Aquinnah), Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, and Mohegan Tribe of Indians of Connecticut Tribal Nations to consider and address tribal concerns within its Phase I archaeological survey area. The archaeological survey [redacted] of the terrestrial APE identified four [redacted] archaeological resources (Forrest and Waller 2021). PAL did not conduct remote sensing (ground-penetrating radar, soil resistivity, magnetometry, or similar techniques). Dense surface vegetation made remote sensing impractical, and twentieth-century dumping, filling, and other ground disturbances and landscape modifications would have produced inconclusive results. The RIHPHC also has not favored remote sensing as a method sufficiently reliable for archaeological site identification in and of itself, preferring ground truthing instead to include the excavation of test pits or other excavation units.

3.1.3 Report Summary – Visual

The onshore and offshore Historic Resources Visual Effects Analyses (HRVEAs) and cumulative HRVEA (CHRVEA) identify the range of above ground historic properties identified in the visual APE for onshore and offshore project facilities, elements, or components (interchangeably). The CHRVEA builds from the results of the HRVEAs to assess where the effects of the Project may combine cumulatively with those of other reasonably foreseeable offshore wind projects (SWCA 2022).

For the onshore components' viewshed, the HRVEA identified a total of 80 above ground viewshed resources, within 3 miles of the proposed OnSS and ICF, that consist of 16 NRHP-listed properties, two properties that have been determined by the RIHPHC to be eligible for the NRHP, nine properties included in the RIHPHC inventory but without formal determinations of NRHP eligibility, and 53 RIHCC-identified Rhode Island Historical Cemeteries (EDR 2021a). Viewshed analyses determined that of these 80 viewshed resources, two are within the visual APE. These two resources are located within the viewshed of the OnSS and ICF. The viewshed analysis determined that neither are within the viewshed of any of the five potential O&M facility locations considered in the COP. At 1.1 miles away from the OnSS and ICF location is the NRHP-listed Wickford Historic District; at 0.25 mile away is the Quonset Point Naval Air Station, determined by the RIHCC to be NRHP eligible (EDR 2021a). The historic Quonset Point Naval Air Station is also addressed in the offshore HRVEA (EDR 2022a).

In relation to the offshore Project components, the HRVEA identified a total of 451 above ground historic properties within the visual APE that consist of 97 NRHP-listed properties, 69 historic properties that have been determined eligible for the NRHP, six TCPs, 279 properties included in the RIHPHC, Massachusetts Historical Commission (MHC), or local historic inventories but without formal determinations of NRHP eligibility (EDR 2022a). Those without formal determinations of NRHP eligibility are treated as historic properties in the HRVEA and in this Finding. Twelve of the NHRP-listed viewshed resources are also NHLs (EDR 2022a). These are the Montauk Point Lighthouse, Block Island Southeast Lighthouse, Original U.S. Naval War College Historic District, Fort Adams Historic District, Battle of Rhode Island Historic District, Nantucket Historic District, New Bedford Historic District, Ocean Drive Historic District, Bellevue Avenue Historic District, The Breakers, Marble House, and William Watts Sherman House. Three resources documented specifically due to their categorization as TCPs in MA consist of the [redacted] TCP, the [redacted] TCP, and the [redacted] TCP. These TCPs are represented by broad, complex cultural landscapes and connected seascapes (EDR 2022a). The [redacted] TCP is NRHP listed and the [redacted] TCP and the [redacted] TCP have previously been determined NRHP eligible by BOEM.

Table 5. Cultural Resources Investigations Performed by Revolution Wind in the Area of Potential Effects (Marine, Terrestrial, and Visual)

Portion of APE	Report	Description	Key Findings/Recommendations
Offshore	*Marine Archaeological Resources Assessment* (SEARCH 2022)	Assessment of marine archaeological resources through remote sensing technologies of the marine APE	This MARA identified 19 shipwrecks/possible historic shipwrecks and 10 geomorphic features (ASLFs) of archaeological interest. SEARCH concluded avoidance is possible for 20 of these historic property types through a 164-foot (50-meter) buffer in radius around the extent of the identified resource. Full avoidance was determined is not feasible at the remaining nine ASLFs and further action was recommended as necessary.*
Onshore	*Terrestrial Archaeological Resources Assessment Revolution Wind Farm Project Onshore Facilities* (Forrest and Waller 2021)	Phase I archaeological survey for the onshore components to identify terrestrial archaeological sites	This TARA identified four [redacted] archaeological sites. Two of the sites, [redacted] #1 and [redacted] #2, were recommended eligible for the NRHP under Criteria A and D. Full avoidance of the two historic properties was determined not feasible and further action was recommended as necessary (Forrest and Waller 2021).*
Visual	*Visual Impact Assessment and Historic Resources Visual Effects Analysis Revolution Wind Onshore Facilities* (EDR 2021a)	Report analyzing the viewsheds surrounding the O&M, OnSS, and ICF facilities proposed for Quonset Business Park/Quonset Point	This HRVEA identified 80 above ground historic properties within 3 miles of the proposed OnSS and ICF. Viewshed analyses determined that a total of two above ground historic properties are located within the viewshed of the OnSS and ICF but are not within the viewshed of any of the five potential O&M facility locations. One of these historic properties, the Quonset Point Naval Air Station, is additionally reviewed in the offshore HRVEA (EDR 2022a). No adverse effects were found to above ground historic properties from proposed onshore project components (EDR 2021a).

Portion of APE	Report	Description	Key Findings/Recommendations
Visual	*Historic Resources Visual Effects Analysis Revolution Wind Farm* (EDR 2022a)	Report analyzing the viewsheds from the WTGs and OSS through GIS modeling to determine the area of Project visibility and define the APE for historic properties sensitive to visual effects	This HRVEA identified 451 above ground historic properties within the APE, including 12 NHLs and six TCPs. These historic properties were analyzed with respect to the potential for visual effects. They were assessed according to the visibility of the offshore Project WTGs and OSS and potential Project effect on the characteristics of historic properties that make them eligible for NRHP listing. A total of 101 above ground historic properties would be adversely affected by the Project under maximum potential visibility (EDR 2022a). BOEM's further analysis of these results in the CHRVEA finds that the combined visual effects of the Project with those of other reasonably foreseeable offshore wind projects would additionally result in cumulative adverse effects to these 101 historic properties (SWCA 2022). These 101 include five NHLs and two TCPs. Full avoidance of visual effects to the 101 historic properties was determined not feasible and further action was recommended as necessary in the HRVEA and CHRVEA.*

* Note: In confidential COP Appendix BB (EDR 2022c), Revolution Wind has proposed further measures to avoid, minimize, and mitigate adverse effects from the Project to historic properties. BOEM continues meeting with consulting parties to take into account the effects of the undertaking on historic properties and to reach resolution of adverse effects through preparation and implementation of a memorandum of agreement (MOA). BOEM has drafted avoidance, minimization, and mitigation measures for historic properties in both the MOA and the historic property treatment plans attached to the MOA.

3.2 Consultation and Coordination with Consulting Parties and the Public

3.2.1 Early Coordination

Since 2009, BOEM has coordinated OCS renewable energy activities for the RI/MA and MA WEAs with its federal, state, local, and tribal government partners through its intergovernmental Renewable Energy Task Force. BOEM has met regularly with federally recognized Native American Tribal Nations (Tribal Nations) that could be affected by renewable energy activities in the area since 2011, specifically during planning for the issuance of offshore wind energy leases and review of site assessment activities proposed for those leases. BOEM also hosts public information meetings to update interested stakeholders on major renewable energy milestones. Information on BOEM's RI/MA and MA Renewable Energy Task Force meetings is available at https://www.boem.gov/Massachusetts-Renewable-Energy-Task-Force-Meetings, and information on BOEM's stakeholder engagement efforts is available at https://www.boem.gov/renewable-energy/state-activities/public-information-meetings.

3.2.2 National Environmental Policy Act Scoping and Public Hearings

On April 30, 2021, BOEM published the notice of intent (NOI) to prepare an EIS for the Revolution Wind COP and published a revised NOI on June 4, 2021 (BOEM 2021a; BOEM 2021b), extending the public scoping period to June 11, 2021. The purpose of the NOI was to announce BOEM's intent to prepare an EIS and to start the public scoping period for the NEPA effort wherein BOEM solicits public input on issues of concern and potential alternatives to be considered in the EIS. Through this notice, BOEM announced that it would use the NEPA substitution process for the Section 106 review for this undertaking, in accordance with Section 106 implementing regulations.

During the public scoping period, BOEM held three virtual scoping meetings for consulting parties and the public, which included specific opportunities for engaging on issues relative to Section 106 for the Project, on Thursday, May 13; Tuesday, May 18; and Thursday, May 20, 2021. Through the NEPA scoping process, BOEM received comments related to cultural, historic, archaeological, and tribal resources. BOEM's EIS scoping report includes these comments (BOEM 2022b).

BOEM intends to publish a notice of availability of the draft EIS for the COP in early September 2022. As part of this process, BOEM will hold a 45-day comment period and public meetings, providing further opportunity for engagement on issues pertinent to Section 106 review.

3.2.3 Section 106 Consultation

BOEM sent Section 106 consultation invitations to 127 potential consulting parties pursuant to 36 CFR 800.3(f) of the Section 106 regulations, via mail and email between April 2 and 30, 2021. Additional consulting parties were invited throughout the consultation process, as they were identified. Throughout spring and early summer 2021, as third-party consultant to BOEM, SWCA Environmental Consultants (SWCA) followed up with parties to confirm preferred points of contact and interest in participating. The organizations BOEM invited to consult beginning in April 2021 are listed in Table 6.

Table 6. Parties Invited to Participate in 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
	RIHPHC
	New York State Division for Historic Preservation
	MHC
	Massachusetts Board of Underwater Archaeological Resources
	Massachusetts Commissioner on Indian Affairs
	Rhode Island Department of Environmental Management
Federal agencies	National Park Service (NPS)
	National Oceanic and Atmospheric Administration – Habitat and Ecosystem Services Division
	U.S. Army Corps of Engineers, New England District
	U.S. Army Corps of Engineers, New York District
	Office of the Deputy Assistant Secretary of the Navy for Environment (DASN(E))
	Naval Facilities Engineering Systems Command Headquarters– Cultural Resources
	Naval History and Heritage Command – Underwater Archaeology Branch
	Bureau of Safety and Environmental Enforcement
	U.S. Department of Defense - Office of the Deputy Assistant Secretary of Defense (Environment), Environmental Compliance and Planning
	U.S. Department of Defense - Office of the Assistant Secretary of Defense for Sustainment
	ACHP
	U.S. Coast Guard -Sector SE New England
	U.S. Coast Guard - Marine Transportation Systems (CG-5PW)
	U.S. Coast Guard – First Coast Guard District
	U.S. Fish and Wildlife Service
	Environmental Protection Agency
	Federal Aviation Administration

Participants in the Section 106 Process	Invited Consulting Parties
Federally recognized Tribal Nations	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 Tribal Nations	Chappaquiddick Tribe of Wampanoag Nation
	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
	Unkechaug Nation
Local governments	Cape Cod Commission
	City of Newport
	County of Dukes (MA)
	Town of Charlestown
	Town of East Hampton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission
	Town of Narragansett
	Town of North Kingstown
	City of Cranston
	City of East Providence
	City of Fall River
	City of New Bedford
	City of Providence
	City of Rehoboth
	City of Taunton
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Plymouth (MA)
	County of Suffolk (NY)

Participants in the Section 106 Process	Invited Consulting Parties
	Town of Acushnet
	Town of Aquinnah
	Town of Barnstable
	Town of Barrington
	Town of Berkley
	Town of Bourne
	Town of Bristol
	Town of Chilmark
	Town of Coventry
	Town of Dartmouth
	Town of Dighton
	Town of East Greenwich
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Freetown
	Town of Gosnold
	Town of Griswold
	Town of Groton
	Town of Hopkinton
	Town of Jamestown
	Town of Johnston
	Town of Lakeville
	Town of Ledyard
	Town of Little Compton
	Town of Marion
	Town of Mashpee
	Town of Mattapoisett
	Town of Middleborough
	Town of Nantucket
	Town of New Shoreham
	Town of North Stonington
	Town of Oak Bluffs

Participants in the Section 106 Process	Invited Consulting Parties
	Town of Portsmouth
	Town of Richmond
	Town of Rochester
	Town of Sandwich
	Town of Scituate
	Town of Seekonk
	Town of Somerset
	Town of South Kingstown
	Town of Southold
	Town of Stonington
	Town of Swansea
	Town of Tisbury
	Town of Tiverton
	Town of Voluntown
	Town of Wareham
	Town of Warren
	Town of Warwick
	Town of West Greenwich
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport
Non-governmental organizations or groups	Alliance to Protect Nantucket Sound
	Balfour Beatty Communities
	Block Island Historical Society
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	Gay Head Lighthouse Advisory Committee
	Martha's Vineyard Commission
	Montauk Historical Society
	Newport Historical Society
	Newport Restoration Foundation
	Preservation Massachusetts
	Rhode Island Historical Society

Participants in the Section 106 Process	Invited Consulting Parties
	Salve Regina University
	Southeast Lighthouse Foundation
	The Preservation Society of Newport County
	Revolution Wind (lessee)

Entities that responded to BOEM's invitation to consult or were subsequently made known to BOEM and added as consulting parties are listed in Table 7.

Table 7. Consulting Parties Participating in 106 Consultation

Participants in the Section 106 Process	Participating Consulting Parties
SHPOs and state agencies	Connecticut State Historic Preservation Office
	Connecticut Department of Economic and Community Development
	RIHPHC
	New York State Division for Historic Preservation
	MHC
	Rhode Island Department of Environmental Management
Federal agencies	NPS
	U.S. Army Corps of Engineers, New England District
	U.S. Army Corps of Engineers, New York District
	Office of the Deputy Assistant Secretary of the Navy for Environment (DASN(E))
	Naval Facilities Engineering Systems Command Headquarters–Cultural Resources
	Naval History and Heritage Command – Underwater Archaeology Branch
	U.S. Department of Defense - Office of the Deputy Assistant Secretary of Defense (Environment), Environmental Compliance and Planning
	U.S. Department of Defense - Office of the Assistant Secretary of Defense for Sustainment
	ACHP
	Bureau of Safety and Environmental Enforcement
	U.S. Coast Guard -Sector SE New England
	U.S. Coast Guard - Marine Transportation Systems (CG-5PW)
	Environmental Protection Agency

Participants in the Section 106 Process	Participating Consulting Parties
	Federal Aviation Administration
Federally recognized Tribal Nations	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 Tribal Nations	Chappaquiddick Tribe of Wampanoag Nation
	Unkechaug Nation
Local governments	City of Newport
	County of Dukes (MA)
	Town of Charlestown
	Town of East Hampton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission
	Town of Narragansett
	Town of North Kingstown
	Town of New Shoreham
Nongovernmental organizations or groups	Block Island Historical Society
	Gay Head Lighthouse Advisory Committee
	Newport Restoration Foundation
	The Preservation Society of Newport County
	Rhode Island Historical Society
	Salve Regina University
	Southeast Lighthouse Foundation
	Revolution Wind (lessee)

On January 15–17, July 21 and 27, and August 20, 2020; on March 12 and April 9 and August 2 and 13, 2021; and on February 3, May 2, and June 1 and 2, 2022, BOEM met with federally recognized Tribal Nations to simultaneously discuss multiple BOEM actions. Officials with the Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, and Wampanoag Tribe of Gay Head (Aquinnah) have attended Project cooperating agency meetings to date. BOEM received comments from the Tribal Nations during June 2021 cooperating agency meetings in the scoping of Project alternatives and weighed these in the identification of alternatives to consider in detailed EIS analyses (BOEM 2022a). See EIS Appendix A at *Government-to-Government Consultation with Federally Recognized Indian Tribes* (BOEM 2022a). The Mohegan Tribe of Indians of Connecticut, the Mashantucket Pequot Tribal Nation, the Narragansett Indian Tribe, the Wampanoag Tribe of Gay Head (Aquinnah), the Mashpee Wampanoag Tribe, the Shinnecock Indian Nation, the Delaware Nation, and the Delaware Tribe of Indians participated in various of the meetings. BOEM continues to consult with these and other Tribal Nations on developments in offshore wind and the Project. BOEM is planning additional government-to-government consultations for the future.

In correspondence and subsequent 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 Section 106 virtual consultation meeting with consulting parties on December 17, 2021, reviewing the Project background; NEPA substitution in the Section 106 process, consultation schedule, and timing; and Section 110(f) consultation requirements and BOEM's compliance with these requirements. On February 28, 2022, the historic properties assessment/analysis reports were distributed to consulting parties (MARA, TARA, HRVEAs, and CHRVEA). BOEM held a second Section 106 virtual consultation meeting with consulting parties on April 8, 2022, reviewing technical report information and the agency's preliminary assessment of historic properties. BOEM provided a revised MARA (SEARCH 2022), offshore HRVEA (EDR 2022a), CHRVEA (SWCA 2022) and accompanying documents (i.e., a memo on HRVEA [EDR 2022b], documentation of response to comments on historic properties assessment and analysis reports, and an updated consultation schedule), and redistributed the previously provided TARA (Forest and Waller 2021) and the onshore HRVEA (EDR 2021a), in August 2022. In the updated schedule, BOEM has planned the third Section 106 virtual consultation meeting with consulting parties for September 2022, reviewing the changes to the historic properties assessment/analysis reports and the Finding and draft MOA. Meeting summaries and access to recordings of the meetings were made available to consulting parties following each meeting.

In spring 2022, consulting parties provided comments on the distributed historic properties assessment and analysis reports on the identification of historic properties and preliminary considerations of effect on these properties as presented in the MARA, TARA, HRVEAs, and CHRVEA. BOEM's response to these comments were provided in a response-to-comment document release with, and are reflected in, the revised versions of the historic properties assessment/analysis reports, which were distributed to consulting parties in August 2022.

BOEM will continue meeting with consulting parties to take into account the effects of the undertaking on historic properties and to reach resolution of adverse effects through preparation and implementation of a MOA. A draft MOA was provided by BOEM to consulting parties with the release of this Finding.

4 Application of the Criteria of Adverse Effect

The Criteria of Adverse Effect under 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 in time, be farther removed in distance, or be cumulative. According to the regulations (36 CFR 800.5(a)(2)), adverse effects on historic properties include, but are not limited to:

i. physical destruction of or damage to all or part of the property;

ii. 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's Standards for the Treatment of Historic Properties (36 CFR 68) and applicable guidelines;

iii. removal of the property from its historic location;

iv. change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

v. introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

vi. 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 an Indian Tribe [Tribal Nations] or Native Hawaiian organization; and

vii. transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

4.1 Adversely Affected Historic Properties

4.1.1 Assessment of Effects to Historic Properties in the Marine Area of Potential Effects

As noted in the Introduction (Section 1) to this Finding, BOEM has determined that the undertaking would have an adverse effect on nine historic properties (NRHP-eligible marine cultural resources) within the marine APE (see Table 1). Each of these are ASLF features.

Archaeological surveys within the marine APE identified 29 historic properties within the RWF maximum work area (SEARCH 2022). Of these, 19 are shipwrecks/possible historic shipwrecks and 10 are geomorphic features (ASLFs) of archaeological interest. [redacted]

4.1.1.1 Shipwrecks and Possible Historic Shipwrecks

All 19 shipwrecks/possible historic shipwrecks would be avoided with sufficient buffers by all proposed Project activities that are part of the undertaking, and as a result, there would be no effects to these potential historic properties (SEARCH 2022). Revolution Wind has established a protective buffer extending 50 m (164 feet) from the maximum discernable extent of the shipwreck or unidentified sonar and/or magnetic anomalies delineated in the high-resolution remote sensing survey data sets and would avoid seafloor-disturbing activities within this buffer during construction, operations, and decommissioning activities (SEARCH 2022). BOEM has determined the protective buffer to be sufficient and would require its implementation as a condition of approval if the COP is approved. Because the Project would avoid adverse effects to these shipwrecks/possible historic shipwrecks, which would be eligible for the NRHP based upon their ability to contribute further important historic and archaeological research information under NRHP Criterion D and/or their role in important events in history under NRHP Criteria A, this Finding does not go into detail on their significance and integrity; for greater detail, see the MARA (SEARCH 2022).

4.1.1.2 Ancient Submerged Landforms

As part of the MARA, SEARCH conducted for the COP an inclusive search of pre-contact period archaeological sites (i.e., archaeological sites that were once part of the terrestrial landscape and have since been inundated by global sea level rise during the late Pleistocene and early Holocene) (see BOEM 2020). Revolution Wind followed BOEM (2020), *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR 585*, in identifying and delineating ASLFs and ASLF features with archaeological potential in the marine APE, as described in the MARA (SEARCH 2022). These features may derive their significance from reasons other than their archaeological potential, such as their potential contribution to a broader culturally significant landscape. The MARA applied high-resolution geophysical survey utilizing magnetometer/gradiometer and side-scan sonar, sub-bottom profiler, and seismic data sets to identify ASLF targets or features, then developed a geotechnical testing strategy for collection of vibracore samples to a maximum depth of 20 feet to further refine targets that could be an ancient submerged landscape (SEARCH 2022: Section 3.6).

The vibracore samples recovered were subjected to macrobotanical, pollen, faunal, and radiocarbon sample analyses to further support the identification of marine archaeological sites and to inform the broader paleolandscape reconstruction (SEARCH 2022). Please see the MARA for details on the methods and results of these investigations. Although 10 ASLFs and features were identified that exhibit high archaeological potential, no evidence of human occupation associated with the ASLFs or ASLF features was identified in core samples taken during the submerged cultural resources investigation (SEARCH 2022:Section 5).

The offshore RWF area was once exposed as dry land at the end of the last ice age. Glacial retreat exposed the area beginning approximately 24,000 years before present (B.P.), and it remained exposed until between 11,000 and 8,000 B.P. when sea levels rose to submerge the area (SEARCH 2022). ASLFs are the formerly terrestrial landscapes exposed between the time of glacial retreat and submersion by the sea. Features identified as discrete surviving remnants of these landscapes, albeit submerged, are persisting areas [redacted]. ASLFs are a finite resource that [redacted]

[redacted] serve as an archaeological and scientific source of information for understanding the past climatic regimes, landscapes, and resources present [redacted] during ancient times. [redacted] (Joy 2018; SEARCH 2022). Additionally, low-lying areas only require low-energy sea level rise to reach inundation. With the onset of rapid sea level rise however, these same low-lying environments could have been submerged deeply and quickly, leading to potentially deeply buried, intact former terrestrial soils with higher preservation potential than high-elevation areas (SEARCH 2022). As such, using seismic data sets, sub-bottom profiler data, and preliminary ground model and geologic interpretation SEARCH employed a paleoreconstruction model within the RWF and RWEC areas to identify the ASLFs with the highest potential for preservation. The MARA identified 10 total ASLF features (Target-21 through Target-30). Of these 10, five are located within the RWEC corridors (Target-21, Target-22, Target-29, and Target-30 within the RWEC in RI and Target-23 within RWEC on the OCS) and five are located within the RWF area (Target-24 through Target-28) (see Table 1). Horizontal and vertical extents of the 10 ASLFs are presented in Section 5 of the MARA, in detail. Of these 10 targets, the MARA states explicitly:

> [redacted] The extent of the intact geomorphic features of archaeological interest within the APE is relatively minimal due to the relatively shallow impacts of the cable installation process, wind turbine layout, and marine transgression. (SEARCH 2022:196).

The MARA identified that nine of the 10 ASLFs (all except Target-27) could be impacted by proposed Project activities, with the recommendation for further consultation to evaluate these nine features. The MARA identified that the RWF and RWEC areas have been subject to heavy erosion and redistribution of sediments through glacial and marine processes, thereby diminishing the chance of identifying persevered, intact ASLFs except for the 10 identified here (SEARCH 2022:Section 6). The majority of the Project's seafloor disturbance—in areas where ASLFs occur—is limited to 3 to 4 m (10 to 13 feet) bsb. [redacted] (SEARCH 2022).

Although geomorphic features (the ASLFs) exhibit high archaeological potential; as the MARA notes, no evidence of human occupation associated with the ASLFs was identified in core samples taken during the submerged cultural resources investigation (SEARCH 2022).

The 10 identified ASLFs are NRHP eligible at minimum for their connection to broad events within [redacted] history under NRHP Criterion A and for their ability to contribute further information to the understanding of that history under NRHP Criterion D, pursuant to 36 CFR 800.16(l) (SWCA 2021a). All ASLF and ASLF features identified in the APE are categorized as sites [redacted] in accordance with the NRHP evaluation criteria (see SWCA 2021a). The 10 ASLF and ASLF features are individually eligible under Criterion A for their associations [redacted]. They are individually eligible under Criterion D for the potential to yield important cultural, historical, and scientific information [redacted] prior to 8,000 B.P. Consistent with NRHP Bulletin 15, natural features or sites "unmarked by cultural materials" can be eligible under Criterion D where "the study of the feature, or its location, setting, etc… will yield important information about the event or period with which it is associated" under Criterion A, and "usually in the context of data gained from other sources" (NPS 1997:22).

The ASLF and ASLF features identified within the APE each retain integrity of location, setting, association, and feeling. [redacted]. ASLFs occupy a unique location within a relict terrestrial landscape and the information that their paleosols and positions on the landscape may provide is important in understanding the earliest history of the region (SWCA 2021a). All ASLF and ASLF features were identified in the APE through confirmation of evidence of relict terrestrial surfaces or sediments.

Integrity of setting is important to ASLFs and ASLF features. [redacted] (SWCA 2021a). [redacted] The 10 ASLF features in the marine APE for the Project retain their integrity of setting.

Integrity of association is important for connection of ASLFs and ASLF features [redacted] (SWCA 2021a). The 10 ASLF features in the marine APE for the Project continue to convey these associations [redacted].

Integrity of feeling is key to the significance of these properties [redacted]. Though now submerged, the ASLFs document the paleoclimate [redacted] through palynological, geochemical, and other analysis points of the prehistoric natural environment. These ASLFs and ASLF features provide well-preserved evidence of the landscape [redacted] (SWCA 2021a). [redacted]

[redacted] (SWCA 2021a). The 10 ASLF features in the marine APE for the Project retain their integrity of feeling. Under NRHP Criteria B and C, insufficient information is available to determine eligibility for the 10 ASLF in the marine APE for the Project.

ASLFs and ASLF features are preserved under limited conditions, making persisting sites rare examples of the property type. However, they retain [redacted] their historic character and significance (SWCA 2021a), in accordance with NRHP Bulletin 15 (NPS 1997). No cultural materials, patterns of design, or elements of workmanship have yet been identified at these ASLFs or ASLF features. The 10 ASLF features in the marine APE for the Project are not known to retain integrity of material, workmanship, and design.

BOEM has found that the Project would result in adverse effects to nine of the 10 ASLFs within the RWF and RWEC areas; however, Revolution Wind would use micrositing of project cabling and WTGs to the extent able to avoid these adverse effects (e.g., by placing cabling in younger sediments [redacted]). In the terms of the Criteria of Adverse Effect, where the ASLFs are not avoidable, the undertaking would result in the permanent irreversible physical destruction at or damage to nine of the ASLF features (excluding ASLF Target-27). [redacted] At Target-21, Target-22, Target-23, Target-29, and Target-30, [redacted] impacts would be limited and could be minimized by micrositing (SEARCH 22). At Target-24, [redacted] impacts would be limited and could be minimized by micrositing (SEARCH 22). Target-25 may not be avoidable by WTG placement under the maximum case scenario, however, could be avoidable by alternatives where fewer than 100 WTGs would be constructed. At Target-25, [redacted] impacts would be limited and could be minimized by micrositing (SEARCH 22). At Target-26, [redacted] direct impacts would be unlikely and could be avoided by micrositing (SEARCH 22). Project siting would avoid the known extent of Target-27 by an avoidance distance of over 165 feet (50 m) from the Target-27 feature extent. At Target-28, WTG placement and workspaces could be microsited to avoid [redacted] the maximum-case scenario for the IAC (SEARCH 22).

4.1.2 Assessment of Effects to Historic Properties in the Terrestrial Area of Potential Effects

BOEM has determined that the undertaking would have an adverse effect on two historic properties ([redacted] archaeological sites) within the terrestrial APE (see Table 2). Overall, the TARA identified four [redacted] archaeological resources. [redacted] (Forrest and Waller

2021). [redacted] #1 archaeological site and the [redacted] #2 archaeological site are eligible for NRHP listing under Criteria A and D and are archaeologically significant (see Table 2).

> [redacted] #1 . . . likely contains significant new information [redacted] #1 is eligible for listing in the National Register under Criteria A and D. (Forrest and Waller 2021:4-24)
>
> [redacted] #2 Site may contain significant new information [redacted] #2 Site is eligible for listing in the National Register under Criteria A and D. (Forrest and Waller 2021:4-25)

Revolution Wind is committed to avoiding or minimizing impacts to these sites to the best extent feasible. However, [redacted] plans are unlikely to be able to fully avoid impacts to these two historic properties, and adverse effects would result. Therefore, BOEM will continue to consult with the Tribal Nations, Revolution Wind, other federal and state agencies, and consulting parties to develop and implement an archaeological mitigation/treatment plan to resolve adverse effects that Project construction would have on the [redacted] #1 and [redacted] #2 sites. These mitigation measures would be made a requirement of the MOA for the project. [redacted]

4.1.3 Assessment of Effects to Historic Properties in the Visual Area of Potential Effects

BOEM has determined that the undertaking will have an adverse effect on 101 historic properties within the visual APE for offshore development (see Table 3). Of the 101 above ground historic sites and districts in the visual APE that could be susceptible to visual adverse impacts from the offshore components of the Project, 37 are listed on the NRHP (five of which are also NHLs) and the remaining 64 are properties that have been determined to be eligible for the NRHP (a total of 33) or (a total of 31) are included in the inventories of the RIHPHC, MHC, or local entities with final determinations of NRHP eligibility pending. The 101 adversely affected above ground historic properties are coastal properties with open ocean viewsheds toward the RWF. They include five NHLs in RI: Southeast Lighthouse on Block Island and Ocean Drive Historic District, Bellevue Avenue Historic District, The Breakers, and Marble House at Newport. They include two TCPs in MA [redacted].

Although the visual APE for onshore development also contains two historic properties in the viewshed of the OnSS and ICF, BOEM has determined that no adverse effects would result at these two historic properties. The historic Quonset Point Naval Air Station and Wickford Historic District are within the visual APE of the OnSS and ICF; however, these onshore Project facilities would be in scale and character with the current use of the Quonset Point Naval Air Station and would not introduce contrasting visual elements inconsistent with either that naval air station or with the existing setting of the Wickford Historic District (BOEM 2021a). Although the historic Quonset Point Naval Air Station is also in the range of potential physical effects due to the potential construction of the Project's RWEC landfall and onshore cable siting on Quonset Point, BOEM has determined that physical Project disturbance would not dimmish the integrity of the Quonset Point Naval Air Station and no adverse effects would result.

The HRVEA identified the 101 adversely affected historic properties from 451 above ground historic properties in the viewshed of offshore project components and therefore in the visual APE; 246 of these are in MA, 197 in RI, 6 in NY, and 2 in CT (EDR 2022a:Table 3.1.1-1 and Attachment A). To determine visual APE intersections with these 451 historic properties, the HRVEA used the Spatial Join extension in the ESRI ArcGIS® software and refined historic property parcel boundaries to determine which historic properties, identified in files searches and previous historic properties surveys, overlaid with the modeled Project viewshed (EDR 2022a, 2022b). The results of this exercise were then manually reviewed to confirm the location of each resource in areas of potential visibility (EDR 2021). This process was then repeated to determine which resources had visibility of RWF aircraft warning lights and the OSS. Finally, redundant resource points were eliminated, along with contributing resources (e.g., those not individually recorded as historic properties) which were located within historic districts (EDR 2022a).

In this Finding, consistent with the HRVEA, "historic districts within the [APE] were counted as a single property regardless of the number of contributing properties located within the [APE] in each district, as it was considered a conservative approach to address potential impacts to the entirety of the district rather than just select properties. Available documentation for NHL and NRHP-listed districts did not always indicate the total number of contributing properties, or which properties are considered to be contributing to the significance of a given district" (EDR 2022a:19). This means that effects to historic districts and the contributing properties within them were considered as a whole, inclusive of those portions of the district that may extend beyond the APE.

> Potential impacts to above-ground historic properties within the [visual]APE which have individual designations apart from the historic districts in which they are located were evaluated on an individual basis. Potential impacts to historic districts within the [visual] APE were considered to the entirety of the district as one property, rather than to each of the contributing properties, as not all contributing properties within historic districts are located in the [visual]APE. This approach is considered to be conservative as far as addressing potential impacts to historic districts as a whole. (EDR 2022a:18)

As the HRVEA notes, the primary "potential effect resulting from the introduction of wind turbines into the visual setting for any historic or architecturally significant property is dependent on a number of factors, including distance, visual dominance, orientation of views, viewer context and activity, and the types and density of modern features in the existing view (such as buildings/residences, overhead electrical transmission lines, cellular towers, billboards, highways, and silos)" (EDR 2022a:102).

> Potential visual effects were assessed by considering a number of factors for each above-ground historic property, including:
>
> - Maritime setting
> - Contribution of views of the sea to the above-ground historic property's significance
> - The location and orientation of the above-ground historic property relative to the shoreline/sea
>
> EDR reviewed the characteristics contributing to historic significance for each of the identified above-ground historic properties that have been determined as part of NRHP resource documentation, or state-level NRHP eligibility determinations (where such documentation was available) to determine whether or not the property had a significant maritime setting. . . . For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. . . .
>
> Significant views to the sea were assessed by desktop review of online mapping systems as well as field observation to determine whether the above-ground historic property has clear, unobstructed views of the sea and whether or not this view contributes to the historic significance of a given property. The distance and direction of view related to the intended historic purpose of above-ground historic properties with maritime setting was also given consideration in this assessment. . . .
>
> Eight distinct and empirical points of measurement were also considered in the assessment of the Project's potential visual effect on above-ground historic properties within the [visual]APE. These points of measurement were determined using the viewshed analysis generated through ArcGIS as described [above], and are further defined in the [visual impact assessment] VIA (EDR [2021c]). They include the following:
>
> - Distance from the nearest visible turbine
> - Blade tip visibility
> - Turbine Aviation light visibility
> - Mid-tower aviation light visibility
> - Coast Guard light visibility
> - Total acreage of above-ground historic property

- Total acreage of visibility within the above-ground historic property
- The portion of the above-ground historic property (percent of acreage) from which the Project would be potentially visible

> . . . While all the resources within the [visual]APE have theoretical views of the wind turbines, due to the effect of distance as well as the Earth's curvature on visibility, not all of the resources would have views of full turbines (i.e., in which the entire turbine structure was visible). In order to provide the most conservative level of analysis of potential Project visibility, the number of turbines for which turbine blade tips were visible was used in determining the number of turbines visible from a given above-ground historic property.
>
> Upon a manual review of the viewshed results, it was found that in some cases the amount of potential visibility which was found to intersect . . . historic property boundaries was relatively small, in some cases single "cells" or "pixels" and would not represent any noticeable amount of actual visibility. Single cells of visibility produced in the viewshed analysis represent 0.00222-acre, or approximately 96 square feet (8.9 sq. m) of space and may be considered erroneous or otherwise not representative of actual visibility. Therefore, although the viewshed analysis indicated that these small portions of the [APE] occur within the boundaries of an historic property, these historic properties with only one "cell" of visibility were not considered to have actual views of the Project.
>
> In addition, [many] above-ground historic properties within the [visual]APE have large boundaries (i.e., over 10 acres), so that even a small percentage of the viewshed within such a property's acreage could be relatively large. For example, the Kay St.-Catherine St.-Old Beach Road Historic District (73000052) occupies 303 acres in the City of Newport. The viewshed analysis indicated that four percent of this property had potential views of the RWF. In this case, four percent of the property is approximately 13 acres, which is still a relatively large area of visibility.
>
> Therefore, this quantitative assessment was intended to provide a baseline level of effects which was then supplemented with a qualitative assessment of the contribution of a property's maritime setting to its historic significance, the level of Project visibility, relationship of specific views towards the Project to the location, design, and historic use of an above-ground historic properties, and the overall sensitivity of each above-ground historic properties to visual effects. (EDR 2022a:102–106)

Because relevant "maritime settings vary considerably among the different types of historic properties" in the visual APE, the HRVEA grouped the historic properties where Project effects would result by resource type and discusses thematically (EDR 2022a:102). The HRVEA found the identified historic properties to be broadly categorizable as follows:

- Native American Sites, Historic Districts, and TCPs;
- Historic Buildings and Structures;

- Lighthouses and Navigational Aids;
- Recreational Properties;
- Historic Cemeteries and Burial Grounds;
- Maritime Safety and Defense Facilities;
- Agricultural Properties;
- Estates/Estate Complexes; and
- Historic Battlefields.

Above ground historic properties within each of these categories tend to be eligible for NRHP listing because of their contributions to important events in history under Criterion A and/or their embodiment of a significant architectural or engineering design, style, or masterful work under Criterion C. TCPs may additionally be eligible under NRHP Criteria B and D for their connections to important people in the heritage of [redacted] and the important information they can provide regarding [redacted] history, respectively. Some of the historic properties also were found to meet several of the NRHP Criteria Considerations, before being found eligible for NRHP listing under Criteria A, C, or D (EDR 2022a). Additionally, NHLs identified under any category are recognized to "possess exceptional value as commemorating or illustrating the history of the United States" that requires “a higher standard of care when considering undertakings that may directly and adversely affect NHLs” (NPS 2021).

4.1.3.1 Native American Sites, Buildings, Districts, and Traditional Cultural Properties

Six TCPs are identified in the visual APE by the HRVEA (Appendix B). These include three recorded as historic resources in RI: [redacted]. The three resources in MA were originally documented specifically due to their identification [redacted] as TCPs: [redacted], all of which are represented by broad, complex cultural landscapes and connected seascapes (EDR 2022a).

Of the six TCPs in the visual APE, BOEM has determined that the Project would result in visual adverse effects to the [redacted] TCP and the [redacted] TCP due to the proximity of the RWF and due to the importance of the TCPs’ views toward the water, where the visual character of the adjoining landscape and seascape contribute to TCP significance.

The common attributes of this historic property type with respect to visual setting are described by EDR (2022a:42–43) as follows:

> [redacted]
>
> [redacted]
>
> [redacted]

[redacted]

4.1.3.2 Historic Buildings and Structures

There are 251 historic buildings and structures identified in the offshore visual APE (Appendix B). Historic properties of this type "consist mostly of vernacular residences or groupings of residences, with some limited variety of building types within the districts, in addition to historic markers and public parks" (EDR 2022a:102). The variety of buildings and structures associated with this type extends to neighborhood commercial districts and buildings (including industrial sites) and includes supporting infrastructure, such as area bridges, that—in composite—makeup these settlement areas and supported the livelihoods of the local residents. In other cases, the use of the historic residence has changed to commercial, municipal, institutional, educational, religious, transportation or to other non-residential repurposing (EDR 2022a).

Of the 251 historic properties of this type in the visual APE, RI contains 86, MA 163, and CT two (EDR 2022a). Of these historic buildings and structures, 48 in RI and MA possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from the offshore elements of the Project:

<u>Aquinnah, MA</u>
Vanderhoop, Edwin DeVries Homestead
Tom Cooper House
Theodore Haskins House
Gay Head – Aquinnah Town Center HD
3 Windy Hill Drive
71 Moshup Trail
Leonard Vanderhoop House
Gay Head-Aquinnah Coast Guard Station Barracks

<u>Chilmark, MA</u>
Hancock, Capt. Samuel-Mitchell, Capt. West House
Russell Hancock House
Simon Mayhew House
Flaghole
Flanders, Ernest House, Shop and Barn

<u>Dartmouth, MA</u>
Salters Point

<u>Fairhaven, MA</u>
744 Sconticut Neck Road

<u>West Tisbury, MA</u>
Scrubby Neck Schoolhouse

<u>Westport, MA</u>
Westport Point Historic Districts (1of 2)
Westport Point Historic Districts (2 of 2)
Westport Harbor
Gooseneck Causeway

<u>Little Compton, RI</u>
Warren Point Historic District

<u>City of Newport, RI</u>
Kay St.-Catherine St.-Old Beach Rd. HD/The Hill

<u>South Kingstown, RI</u>
Brownings Beach Historic District

New Shoreham, RI
Spring Street
Corn Neck Road
Hippocampus/Boy's Camp/Beane Family
Mitchell Farm
Beach Avenue
Peleg Champlin House
Indian Head Neck Road
U.S. Weather Bureau Station
Old Town and Center Roads
Old Harbor Historic District
New Shoreham Historic District
Beacon Hill Road
Capt. Welcome Dodge Sr.
Caleb W. Dodge Jr. House
Lakeside Drive and Mitchell Lane
Pilot Hill Road and Seaweed Lane
Mohegan Cottage/Everett D. Barlow House
Capt. Mark L. Potter House

Middletown, RI
Indian Avenue Historic District
Paradise Rocks Historic District
St. Georges School
Land Trust Cottages
Sea View Villa
Whetstone

Tiverton, RI
Puncatest Neck Historic District

The HRVEA describes the common attributes of this historic property categorization with respect to the visual setting of the historic properties as follows:

> These above-ground historic property types often are adjacent to and offer clear views of the ocean or are significant due to their development as residential communities. For many above-ground historic properties of this type, a relationship with the Atlantic Ocean is essential to their historic integrity. . . . Historic Buildings and Structures are important elements of cultural heritage within the [APE], within the majority of examples found along or near the shoreline . . . . While no official documentation relative to the maritime significance of this specific above-ground historic property type is known, several common features are mentioned across the breadth of the individual nomination forms that may be considered as the common attributes with respect to their visual setting:
>
> - Historic maritime (fishing and shipping) economy;
> - Location along or near the water;
> - Views and vistas of the Atlantic Ocean;
> - Vernacular design and locally sourced materials;
> - Landscape design derived from the natural environment; and
> - Local historic associations. (EDR 2022a:44)
>
> Historic buildings and structures . . . occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local

> roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting. . . . Historic seaside villages, ports and other districts in the study area are commonly characterized by dense development and narrow roadways. The maritime setting for such districts is often obvious and may be expressed through the design and orientation of homes, commercial properties and other buildings, parks, docks, piers, and breakwaters. Depending on the specific characteristics of each district, open ocean views may or may not be available from the majority of historic buildings and other areas within a village. Further, marine viewsheds may encompass limited areas due to the complexity of the shoreline and presence of points, necks, or islands that screen views towards the open ocean. Where ocean versus bay views are available but are tangential to the dominant aspects of maritime viewsheds, changes to those distant ocean views may not diminish the integrity of a seaside village or other historic district. Where ocean views are a dominant aspect of the maritime setting, changes to such viewsheds may diminish the integrity of a historic district, even where views are limited to immediate shoreline sections. (EDR 2022a:96–97)

4.1.3.3 Lighthouses and Navigational Aids

There are 20 lighthouses and navigational aids identified in the visual APE (Appendix B). This historic property type, lighthouses in particular, "may be broadly defined as water-related navigation aids to transportation and defense consisting of a light tower, featuring prominent views of the sea, and dominance of the surrounding landscape generally shared among all the individual properties" (EDR 2022a:44).

Of the 20 historic properties of this type in the visual APE, MA contains 10, RI nine, and NY one (EDR 2022a). Of these lighthouses and navigational aids, 10 in RI and MA possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from the offshore elements of the Project:

<u>Aquinnah, MA</u>
Gay Head Light

<u>Falmouth, MA</u>
Nobska Point Lighthouse

<u>Gosnold, MA</u>
Tarpaulin Cove Light

<u>New Bedford, MA</u>
Butler Flats Light Station
Clark's Point Light

<u>Jamestown, RI</u>
Beavertail Light

<u>Little Compton, RI</u>
Sakonnet Light Station

<u>Narragansett, RI</u>
Point Judith Lighthouse

<u>New Shoreham, RI</u>
Block Island North Lighthouse
Block Island Southeast Lighthouse NHL

The common attributes of this historic property type with respect to visual setting are described by EDR (2022a:47) as follows:

- Direct physical location and/or historic functional relationship with the sea;
- Elevated and prominent views of the sea;
- Visual prominence of the surrounding landscape;
- Isolation or at least spatial dominance of the surrounding landscape; and
- Proximal relationship to shipping lanes.

> Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid. (EDR 2022a:95)

4.1.3.3.1 Block Island Southeast Lighthouse National Historic Landmark

Among the identified lighthouses and navigational aids, the Block Island Southeast Lighthouse (Figure 1) has been recognized for its importance to U.S. history as an NHL. The HRVEA describes the property as follows.

Figure 1. Block Island Southeast Lighthouse before it was offset from the bluff edge (Stupich 1988).

> This property is located approximately 12 miles (19.3 km) south of the coast of mainland Rhode Island, on Mohegan Bluff, on the southeast shore of Block Island, approximately 14 miles (22.5 km) from the nearest [Project] turbine. . . . Built in 1874 and fully operational by 1875, [Southeast] Lighthouse consists of a five-story brick tower and a two-and-a-half-story, brick duplex keeper's residence. The duplex residence is connected to a one-and-a half-story kitchen by a hyphen of the same height. It is a rare surviving example of a lighthouse built during a brief period of Victorian Gothic design influence at the U.S. Lighthouse Board and the sole surviving lighthouse of its high-style design. In 1993, the lighthouse structure and dwelling were moved approximately 250 feet (76.2 m) back from the edge of the bluffs to prevent the loss of the above-ground historic property to erosion. The light tower and dwelling were moved as a single mass, including the above-ground elements of the foundations, to retain the historic fabric. The new location preserves the historic relationship of the lighthouse with seacoast … Block Island Southeast Lighthouse was designated an NHL in 1995. (EDR 2022a:46)

Block Island Southeast Lighthouse NHL is listed on the NRHP under Criterion A, for its national importance in the history of maritime transportation, and under Criterion C for the national significance of its architecture and technology (SWCA 2021b). The maritime setting of the NHL is a key aspect of historic integrity cited in the NHL nomination. The HRVEA found Block Island Southeast Lighthouse NHL in particular to have high visual sensitivity within the visual APE, due to its historic location, setting, and feeling being primarily associated with clear views of the sea and for which public use enhances appreciation of the property's historic use and association with the sea (EDR 2022a). Approximately 48% (6 acres) of this approximately 134-acre historic property are within the visual APE and would have visibility of Project WTGs and OSS (EDR 2022a:Attachement A). The visual simulations for Block Island Southeast Lighthouse NHL are those at KOP BI-04 (day and night) in Appendix C.

Prudent and feasible alternatives to avoid adverse effects from the Project on this and other NHLs, and planning to the maximum extent possible necessary to minimize harm to NHLs, are presented in Section 5 of this Finding.

4.1.3.4 Historic Cemeteries and Burial Grounds

There are 36 historic cemeteries and burial grounds included in the visual APE (Appendix B), consisting of "cemeteries identified by federal, state, or local governmental agencies as having historic significance" (EDR 2022a:47). Of the 36 historic properties of this type in the visual APE, RI contains 23 and MA 13 (EDR 2022a). RI has specific mandates for documenting historic cemeteries.

Of these, one in RI possesses important settings and critical views of the Project (see EDR 2022a:Attachment A) and has been determined by BOEM to be subject to adverse effects from the offshore elements of the Project: Island Cemetery/Old Burial Ground in New Shoreham, on Block Island. The Island Cemetery/Old Burial Ground would be adversely affected by the Project because of the characteristically elevated ocean views that are maintained for this memorial resting place and the historically maritime populous that it serves. Otherwise, the secluded nature of properties of this type and their rare occurrence near the shoreline greatly limits visibility, and therefore effects, of the Project.

The common attributes of this historic property type with respect to their visual setting are described as follows:

> These above-ground historic properties may be municipally owned cemeteries on public land, small family plots on private land, or abandoned burial grounds. Historic cemeteries are lasting memorials to the past, provide a guide to the changing values and composition of communities in the course of their historic development. . . . Typically, cemeteries and burial grounds are not eligible for listing in the NRHP except when they satisfy NPS Criteria Consideration D: 'd. A cemetery which derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events'. . . . [Attributes include:]
>
> - Secluded or private setting;
> - Designed landscape features;
> - Graves of persons of local, state, or national significance; and
> - Examples of funerary art and/or architecture (i.e., a mausoleum or above-ground crypt). (EDR 2022a:47–48)
>
> Where such burial grounds are located near the water they may be associated with ocean or other maritime viewsheds, however, ocean vistas are less likely to have been a significant consideration in the siting of such cemeteries than their larger, more formal counterparts in the region. Where cemeteries are located within districts or other historic settlements strongly associated with maritime settings, such burial grounds may be sited to maintain a visual connection to the waters in order to maintain a sense of continuity linking the departeds' final resting places with the environment in which they lived. . . . Maritime views from hillside cemeteries that were intentionally incorporated or framed by landscape designs may be more sensitive to discordant modern elements than those associated with less formal burial grounds that may not have been specifically located to provide ocean views. (EDR 2022a:96)

4.1.3.5 Maritime Safety and Defense Facilities

There are 31 maritime safety and defense facilities included in the offshore visual APE (Appendix B), plus one within the onshore visual APE (EDR 2021a). This property type consists of "facilities erected by bureaus of the U.S. Department of Defense or their predecessors and share historic associations with coastal defense" (EDR 2022a:48). Although, "These structures vary in their design and construction materials," they "are unified by their historic functions of rescuing and protecting maritime transportation in the area, or for coastal defense" (EDR 2022a:48).

Of the 31 historic properties of this type in the visual APE, RI contains 20, MA nine, and NY two (EDR 2022a). Of these, 10 in RI and MA possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from the offshore elements of the Project:

New Bedford, MA
Fort Rodman Historic District
Fort Taber Historic District

Westport, MA
Horseneck Point Lifesaving Station
Gooseberry Neck Observation Towers

Narragansett, RI
Life Saving Station at Narragansett Pier
Fort Varnum/Camp Varnum

New Shoreham, RI
U.S. Coast Guard Brick House
U.S. Lifesaving Station
WWII Lookout Tower – Spring Street
WWII Lookout Tower at Sands Pond

The common attributes of this historic property type with respect to their visual setting are described in the HRVEA as follows:

> The Maritime Safety and Defense Facilities within the [APE] have served to protect and act as rescue stations for the coastal waters of Rhode Island and Massachusetts. These above-ground historic properties were constructed as government buildings that needed open views and access to the ocean to fulfill their functional roles and are therefore located immediately adjacent to the coastline to facilitate direct interaction with the water. For all aboveground historic properties of this type, a physical relationship to the Atlantic Ocean is essential to historic integrity. . . . [Attributes include:]
>
> - Construction commissioned by the federal government for use by a bureau of the Department of Defense;
> - Built for interaction between the structure and ocean-going vessels;
> - Location along or near the water;
> - Clear views of the ocean, and/or direct access to the water; and
> - Design includes living quarters and functional space. (EDR 2022a:49)
>
> Historic military and maritime safety properties along the shoreline will likely be associated with maritime settings. Aesthetic considerations in the siting of such facilities may or may not be expressed in the design of buildings, structures, and landscapes depending on the age and specific functions of the property. Proximity to navigation channels, defensibility, and the presence of existing shipbuilding or repair infrastructure in a broader maritime context may have been significant considerations in the siting of naval facilities. Such factors may not demonstrate a significant association with open ocean viewsheds. The study area includes several significant examples of World War II-era defense structures, including fire control or observation towers designed to monitor specific parts of the maritime environment. Early lifesaving stations were likewise intended to provide for observation of marine waters in the vicinity of known hazards or where storms posed specific risks to sea-going or coastal vessels. Lifesaving stations were also frequently located where rescue boats or other vessels might be safely launched under treacherous conditions. These locations may have included inlets, harbors or coves adjacent to open waters where rescue and recovery efforts would likely be made. (EDR 2022a:96)

4.1.3.6 Agricultural Properties

There are 48 agricultural properties included in the visual APE (Appendix B). This property type consists of "historic farm buildings and landscapes which have retained a high degree of integrity and are generally no longer used for their original purpose" (EDR 2022a:49).

Of the 48 historic properties of this type in the visual APE, MA contains 33 and RI 15 (EDR 2022a). Of these agricultural properties, four in RI possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from the offshore elements of the Project:

Little Compton, RI
Tunipus Goosewing Farm

Middletown, RI
Bailey Farm

New Shoreham, RI
Champlin Farm
Lewis-Dickens Farm

Although, "Generally, these above-ground historic properties do not derive their significance in any direct way from the ocean or maritime activities" (EDR 2022a:49), the HRVEA addresses the four cases where adverse effects would result based on the open or maritime island settings of these particular historic properties. The common attributes of this historic property type with respect to their visual setting are described in the HRVEA (EDR 2022a:50) as follows:

- Farmhouses;
- Barns and associated ancillary buildings;
- Large, open fields;
- Fieldstone walls dividing property or grazing space; and
- Locally sourced building materials.

> Historic agricultural properties, including farms, farmhouses, barns and related buildings and structures are relatively common in the study area. Many of these properties were built between 1700 and 1850, after which agricultural economies in New England and New York declined sharply. The historic settings for such properties typically include open, agrarian landscapes which once may have afforded open views of the seas when sited along the shoreline or at higher elevations within the coastal interior. Few of the once expansive agrarian landscapes associated with the historic use of the region's farms survive. Some have been altered by later residential and commercial development and many have been transformed by reforestation. Despite these changes, historic agricultural properties remain an important part of the region's heritage and tangible expression of several centuries of intensive farming that transformed the landscapes throughout southern New England and eastern Long Island. (EDR 2022a:95)

4.1.3.7 Recreational Properties

There are 27 recreational properties included in the visual APE (Appendix B). This property type is "defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish" (EDR 2022a:50).

Of the 27 historic properties of this type in the visual APE, RI contains 20, MA five, and NY two (EDR 2022a). Of these recreational properties, 14 in RI and MA possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from the offshore elements of the Project:

<u>Aquinnah, MA</u>
Gay Head - Aquinnah Shops Area

<u>Westport, MA</u>
Clam Shack Restaurant

<u>Narragansett, RI</u>
The Towers Historic District
The Towers/Tower Entrance-Narragansett Casino
Ocean Road Historic District
Dunes Club
Narragansett Pier MRA

<u>Middletown, RI</u>
Clambake Club of Newport

<u>New Shoreham, RI</u>
Hygeia House
Nathan Mott Park
Spring House Hotel
Spring Cottage
Miss Abby E. Vaill/1 of 2 Vaill cottages
Hon. Julius Deming Perkins/"Bayberry Lodge"

The common attributes of this historic property type with respect to their visual setting are described by HRVEA as follows:

> These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities. . . . [Attributes include:]
>
> - Functionality designed for human interaction;
> - Location along or near the water;
> - Views and vistas of the Atlantic Ocean;
> - Landscaped lawns and gardens; and
> - Ancillary buildings, such as garages, caretaker cottages, or sheds. (EDR 2022a:50–51)
>
> Seaside resorts, like many other shoreline recreational, commercial, and residential properties, were often sited to take advantage of aesthetically pleasing ocean or maritime views. Depending on location and the conformation of the local shoreline, such properties may be associated with specific bay or cove viewsheds that include limited areas of the

> open ocean waters. Recreational activities at resorts frequently included swimming and designated beaches where residents and visitors may have spent considerable time during the summer months. Where these features are still present and express a tangible association with the historic resort property, views from beaches may be as important as views from more formal elements of the designed landscape. Likewise, historic hotels and inns became more common elements of the region's shoreline communities in the late 19th century. Such properties were often sited near harbors, ferry landings, rail stations, and public or private beaches and may be associated with similar historic maritime settings. Views to ocean waters or the more intimate bays and coves of the region may have been an integral part of the visitor's motivation for staying in such establishments. Such considerations can be expressed through the inclusion of building and landscape features clearly intended to afford views of ocean. Older taverns and inns in the study area may be found along the working harbors and ports and were intended to serve the fishing, whaling, and related participants in maritime commerce. The design and location of these properties may not show the same influence of aesthetic considerations but will likely also retain a strong association with the waterfront and maritime environment. (EDER 2022a:95)

4.1.3.8 Estates and Estate Complexes

There are 28 estates and estate complexes included in the visual APE (Appendix B). This property type "consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries" (EDR 2022a:51).

Of the 28 historic properties of this type in the visual APE, RI contains 21 and MA seven (EDR 2022a). Of these, 11 in RI possess important settings and critical views of the Project (see EDR 2022a:Attachment A) and have been determined by BOEM to be subject to adverse effects from offshore Project elements:

<u>Jamestown, RI</u>
Horsehead/Marbella

<u>Little Compton, RI</u>
Stone House Inn
Abbott Phillips House

<u>Middletown, RI</u>
The Bluff/John Bancroft Estate

<u>Narragansett, RI</u>
Dunmere

<u>City of Newport, RI</u>
Ocean Drive Historic District NHL
Bellevue Avenue Historic District NHL
The Breakers NHL
Marble House NHL
Ochre Point – Cliffs Historic District
Rosecliff/Oelrichs (Hermann) House/Monroe (J. Edgar) House

The common attributes of this historic property type with respect to their visual setting are described by the HRVEA as follows:

> Estates and Estate Complexes within the [visual]APE transcend the traditional residential above-ground historic property type in their grandeur and scale. These above-ground historic property types often are set upon open tracts of naturalistic or stylized

designed landscapes and are often accompanied by a variety of ancillary buildings. For many above-ground historic properties of this type, views of the Atlantic Ocean are essential to their historic integrity. . . . Estates and Estate Complexes are well-known as one of the symbols of cultural heritage in Rhode Island, and the City of Newport in particular. . . . [Attributes include:]

- Location along or near the water;
- Views and vistas of the Atlantic Ocean;
- Long driveways meant to offer views of the main house on approach;
- Landscaped lawns and gardens; and
- Ancillary buildings, such as garages, caretaker cottages, or sheds. (EDR 2022a:52)

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed. (EDR 2022a:95–96)

4.1.3.8.1 Ocean Drive Historic District National Historic Landmark

The Ocean Drive Historic District (Figure 2) is one of four of the identified estates and estate complexes recognized for its importance to U.S. history as an NHL. The HRVEA describes this NHL as follows.

> The summer homes in the Ocean Drive Historic District feature great variety in style and opulence, ranging from Neoclassical-style mansions to early nineteenth-century farms. In contrast to the adjacent Bellevue Avenue Historic District, however, Ocean Drive (aka Ocean Avenue) is decidedly more bucolic and rural, with greater expanses between structures accentuated by natural and designed landscapes. The national significance of the Ocean Drive Historic District is derived from its architecture, which includes works from McKim, Mead and White, John Russell Pope, and landscape architecture by Frederick Law Olmstead [*sic*] . . . In 2012 an updated statement of significance was appended to the NHL nomination which elaborated and expanded upon the initial areas of Criterion C significance such as architecture and landscape design. The update also addressed additional Criterion A areas of significance such as planning, and engineering related to maritime views and design features purposefully built to interact with the shoreline and the ocean. The updated nomination materials also included a detailed account of the evolution of Ocean Drive as a "pleasure drive" to accompany the development of the inland areas as an upper-income resort suburb. (EDR 2022a:140)

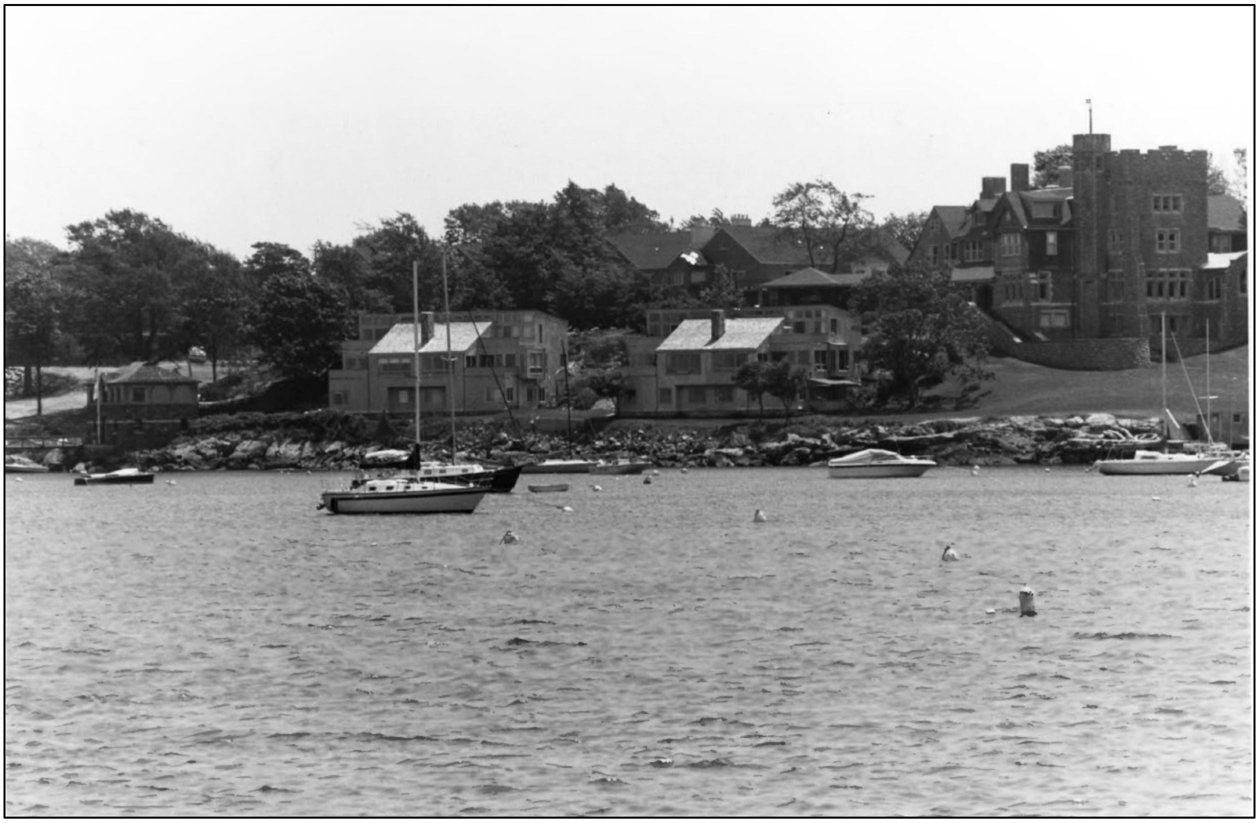

Figure 2. Ocean Drive Historic District photographed from the sea (NRHP 1976).

> [Olmsted's] landscape architecture firm . . . was involved in at least two subdivisions and 15 private contract designs within the district. These designs include properties situated on dramatic overlooks, and along Ocean Drive. Clearly this roadway was specifically constructed to take advantage of ocean views. (EDR 2022a:140)

The Ocean Drive Historic District NHL was made up of 45 contributing properties located in an over-1,500-acre district in a suburban/rural setting encompassing most of the peninsula southwest of the City of Newport (SWCA 2021b). The NRHP nomination finds the district eligible under Criteria A and C in the areas of architecture, landscape architecture, community planning, conservation, and environmental preservation (SWCA 2021b). The NHL program focuses on the district architecture and landscape, providing the following statement of national significance, "This large historic district… has a rugged, informal character, as compared with the formal aspect of the Bellevue Historic District. It includes early farms and elaborate summer homes, as well as landscapes designed by Olmsteds' firm to accord with the natural contours of rocky cliffs, green hills and pastures. The area was favored by 19th-century industrial magnates and the social elite" (NPS 2012). The Ocean Drive Historic District NHL and its contributing buildings tend to retain integrity of location, design, materials, workmanship, association, feeling, and setting (SWCA 2021b). Approximately 15% (261 acres) of this approximately 1,756-acre historic property are within the visual APE and would have visibility of Project WTGs and OSS (EDR 2022a:Attachement A). The visual simulations from Newport Cliff Walk at KOP AI-03 in Appendix C best represent the views from the shorelines and NHLs at Newport, RI.

Prudent and feasible alternatives to avoid adverse effects from the Project on this and other NHLs, and planning to the maximum extent possible necessary to minimize harm to NHLs, are presented in Section 5 of this Finding.

4.1.3.8.2 Bellevue Avenue Historic District National Historic Landmark

The Bellevue Avenue Historic District (Figure 3) is one of four of the identified estates and estate complexes recognized for its importance to U.S. history as an NHL. The HRVEA describes this historic property as follows.

Figure 3. Chateau-sur-mer in the Bellevue Avenue Historic District (Boucher 1969; NRHP 1972).

> 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 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.

> The Bellevue Avenue Historic District National Historic Landmark is approximately two miles long and consists of 87 contributing properties . . . occupying several blocks along Bellevue Avenue, from Memorial Boulevard in the north, to Block Island Sound in the south, in the City of Newport. Spring Street and Cogshell Avenue form the western boundary of the district, while Narragansett Bay forms the eastern boundary. From north to south, this district features two miles of commercial blocks and villas, notably ending in the south with the grand and palatial nineteenth-century estates of wealthy summer residents. (EDR 2022a:A-25)

The district possesses many distinctive examples of high-style architecture. While the significance attributed in the NRHP-nomination of the district does not explicitly reference the ocean, the views of the ocean were essential to the planning and construction of the contributing buildings (SWCA 2021b). The district contains contributing buildings that are also individually recognized has NHLs, specifically The Breakers NHL and Marble House NHL. The NRHP nomination finds the district significant in the areas of architecture, landscape architecture, and commerce (SWCA 2021b). The significance focuses on aspects of the district that make it NRHP-eligible under Criterion C, for the embodiment of distinctive characteristics of a type, period, or method of construction, that represent the work of a master, and possess high artistic values. Significance in the area of commerce further provides for the NRHP-eligibility of the district under Criterion A for its relation to important events in the historic development of Newport (SWCA 2021b). The NHL program more fully focuses on the district architecture, providing the following statement of national significance, "An assemblage of American architecture distinguished by the variety of styles and famous architectural firms represented, the district includes Gothic Revival villas, Stick- and Shingle-style buildings, and great summer palaces of the late 19th century" (NPS 2015a). The Bellevue Avenue Historic District NHL and its contributing buildings tend to retain integrity of location, design, materials, workmanship, association, feeling, and setting (SWCA 2021b). About 13% (over 70 acres) of this approximately 600-acre historic property are within the visual APE and would have visibility of Project WTGs and OSS (EDR 2022a:Attachement A). The visual simulations from Newport Cliff Walk at KOP AI-03 in Appendix C best represent the views from the NHLs on Newport shores.

4.1.3.8.3 The Breakers National Historic Landmark

The Breakers (Figure 4) is an estate/estate complex recognized for its importance to U.S. history as an NHL and located in the Bellevue Avenue Historic District NHL. The HRVEA describes this historic property as follows:

> The Breakers . . . is located on at Ochre Point Avenue in Newport, Rhode Island, approximately 16 miles (25.7 km) from the nearest [Project] turbine. . . . The estate was designed by Richard Morris Hunt and built between 1893 and 1895 for Cornelius Vanderbilt II. It emulates a sixteenth-century, northern Italian palazzo. Elaborate façade work and imposing mass are featured in the architecture and speak to the substantial power and wealth of the original residents. The estate is significant for its historic associations with America's first architect trained at the Ecole Des Beaux-Arts, Richard Morris Hunt, and for being the largest and perhaps most famous Newport estate built by wealthy patrons at the turn of the twentieth century. . . . The Breakers was individually listed in the NRHP in 1971. . . . and designated an NHL in 1994. (EDR 2022a:52)

Figure 4. The Breakers in the Bellevue Avenue Historic District (NRHP 1971a).

The NRHP nomination finds The Breakers significant in the areas of architecture, social history, and transportation (SWCA 2021b). The significance focuses on aspects of the historic property that make it NRHP-eligible under Criterion C, for the embodiment of distinctive characteristics of a type, period, or method of construction, that represent the work of a master, and possess high artistic values. Significance in the area of social history and transportation further provides for the NRHP-eligibility of the historic property under Criterion A for its relation to important events associated with high society in the historic development of Newport and the social position and wealth of the Vanderbilts arriving from the railroad industry. The NHL nomination further indicates eligibility of The Breakers under NRHP Criterion B for significant association with Cornelius Vanderbilt II and Richard Morris Hunt (SWCA 2021b). The NHL program focuses on architecture, providing the following statement of national significance, “The Breakers is the architectural and social archetype of the Gilded Age, a period when members of the Vanderbilt family were the merchant princes of American life through their prominence in the world of finance, as patrons of the arts, and as vanguards of international society. In 1895, the year of its completion, The Breakers was the largest, most opulent house in a summer resort considered the social capital of America. It was built for Cornelius Vanderbilt II (1843-1899), a key figure in American railroads, philanthropy, and fashionable society, and designed by Richard Morris Hunt (1827-1895), one of the founding fathers of architecture in America” (NPS 2006). The Breakers NHL retains integrity of location, design, materials, workmanship, association, feeling, and setting (SWCA 2021b). About 29% (5 acres) of this approximately 16-acre historic property are within the visual APE and would have visibility of Project WTGs and OSS (EDR 2022a:Attachement A). The visual simulations from Newport Cliff Walk at KOP AI-03 in Appendix C best represent the views from the NHLs on Newport shores.

4.1.3.8.4 Marble House National Historic Landmark

Marble House (Figure 5) is an estate/estate complex recognized for its importance to U.S. history as an NHL and is also located in the Bellevue Avenue Historic District NHL. Marble House is describable as follows.

Figure 5. Marble House in the Bellevue Avenue Historic District (NRHP 1971b).

> Marble House (71000025) is a three-story Neoclassical mansion located on Bellevue Avenue in Newport. It was commissioned by William Vanderbilt, designed by famed architect Richard Morris Hunt and constructed 1892. Built with an imposing architectural scale and clad in Tuckahoe white marble, it is one of the stateliest mansions contributing to the NHL-listed Bellevue Avenue Historic District. The property was individually listed on the NRHP before the district was nominated. (SWCA 2021b:30)

The NRHP nomination finds the Marble House significant in the areas of architecture and social history (SWCA 2021b). The significance focuses on aspects of the historic property that make it NRHP-eligible under Criterion C, for the embodiment of distinctive characteristics of a type, period, or method of construction, that represent the work of a master, and possess high artistic values. Significance in the area of social history further provides for the NRHP-eligibility of the historic property under Criterion A for its relation to important events in the historic development of Newport. The NHL nomination additionally finds Marble House eligible under NRHP Criterion B for its significant associations with Alva Belmont and William K. Vanderbilt (SWCA 2021b). The NHL program focuses on architecture, providing the following statement of national significance, “Inspired by the Petit Trianon (1760-1764) a garden retreat on the grounds of Versailles, the house’s French inspired interiors were designed by Jules Allard and Sons, of Paris. A virtual showcase of various French styles and built with seemingly endless financial resources, the house was unparalleled in design and opulence in its day. The economic influence of the Vanderbilts and their financial and cultural power in America were expressed in the family houses and their patronage of American architecture. As one of the earliest of the Beaux Arts houses to appear in America, it would influence the design of architecture thereafter. Today, Marble House is a testament to the architectural genius of Richard Morris Hunt and the spirit of America’s ‘Gilded Age.’” (NPS 2015b). The Marble House NHL retains integrity of location, design, materials, workmanship, association, feeling, and setting (SWCA 2021b). About 5% (one-third acre) of this approximately 6-acre historic property are within the visual APE and would have visibility of Project WTGs and OSS (EDR 2022a:Attachement A). The visual simulations from Newport Cliff Walk at KOP AI-03 in Appendix C best represent the views from the NHLs on Newport shores.

4.1.3.9 Historic Battlefields

There are four historic battlefields included in the visual APE, which “consist of typically large landscapes across which the events of historic military actions took place” and, within these, “any number of more focused and specific points of significance may exist, while the collective significance of the events of the battle is broader” (EDR 2022a:52).

Of the four historic properties of this type in the visual APE, MA contains three and RI one (EDR 2022a). Of these, one historic battlefield in MA, the Westport Point Revolutionary War Properties, would be subject to adverse effects from the Project.

The common attributes of this historic property type with respect to their visual setting are described by the HRVEA as follows:

> These types of above-ground historic properties are typically spread out over large areas, sometimes encompassing entire town centers or portions of townships. They may include landscapes, buildings, or water features which were integral to the outcome of the struggles which took place in their midst. In some cases, these features have been significantly altered from the time of the battles. . . .
>
> [R]egarding the visual setting of battlefields with regard to their significance, as in most cases the significance of an historic battlefield lay in their historic context and the physical struggles that took place on them. However, there are some characteristics which may be generally common to Historic Battlefields:
>
> - Natural features which influenced military operations;
> - Military engineering works (trenches, forts);
> - Sites of engagement; and
> - Corridors of movement. (EDR 2022a:53–54)

Properties of this type are mostly inland and will only have visibility in isolated areas within their boundaries, or in the small areas where their boundaries touch the shoreline. The potential effects of the Project are further mitigated because the significance and setting of these properties are characterized by terrestrial conflict, and not from pristine views of the seascape or relationship to the ocean. (EDR 2022a:109)

4.1.3.10 Summary of the Assessment of Adverse Effects and Cumulative Effects to Historic Properties in the Visual Area of Potential Effects

The 101 adversely affected historic properties within the visual APE for onshore and offshore development retain their maritime setting, and that maritime setting contributes to the property's NRHP eligibility and continues to offer significant seaward views. These seaward views support the integrity of the maritime setting and include vantage points with the potential for an open view from each property toward RWF WTGs (EDR 2021b, 2022a). For historic properties where BOEM has determined the Project would cause adverse effects, BOEM then assessed whether those effects would be additive to the potential adverse effects of other reasonably foreseeable actions at the 101 historic properties, thereby resulting in cumulative effects (see SWCA 2022).

BOEM reviewed the HRVEA's list of historic properties assessed as likely to be adversely affected by the Project and all information and comments provided by consulting parties in correspondence and at meetings to date to inform determinations of adverse effects including visual and cumulative effects.

BOEM (2022a) has determined that options to reduce the number of RWF WTGs under any action alternative for the Project (see Table 1) would effectively minimize visual effects because there would be fewer WTGs constructed and visible from the affected historic properties (see also Section 5). However, none of the alternatives would completely avoid visual adverse effects for the 101 above ground historic properties.

The cumulative effects analysis quantified the total number of WTGs from all planned future developments theoretically visible (daytime or nighttime) within the APE (EDR 2021b). This analysis projected that the development of additional wind farms in the RI/MA WEA would result in the construction of nearly 1,000 WTGs (EDR 2021b, 2022a; SWCA 2022). The project would contribute proportionally from nearly 10% to nearly 90% of the cumulative adverse effect, owing to the location and intensity of the foreseeable build-out attributed to other offshore wind energy development activities. This is based on full buildout of the Project (up to 100 WTGs and two offshore substations [OSS]) and all other reasonably foreseeable offshore wind projects currently planned in the APE (modeled at 955 WTGs and three OSSs [EDR 2021b]). The proportion of visible WTG elements added by the project ranges from 9.6 percent at [redacted] TCP, where all modeled WTGs and OSS would potentially be visible, to 87.2 percent at the historic U.S. Weather Bureau Station at Block Island, where the Project WTGs would potentially be visible in greater numbers than the combination of all other future wind farms planned in adjacent OCS lease areas (41 Project WTGs would potentially be visible there versus six WTGs from other planned projects) (SWCA 2022). Intensity of visual impacts from WTG and OSS development would reduce with distance from historic properties and lighting and design actions that would be taken by Revolution Wind to minimize impacts; however, cumulative effects would not be fully eliminated at the 101 adversely affected historic properties.

BOEM has found that the Project would have adverse visual effects on the 101 historic properties listed in Table 3. Per the Criteria of Adverse Effect, the undertaking would introduce visual Project elements that diminish the integrity of these historic properties' significant historic features. BOEM did, however, determine that due to the distance and open viewshed, the integrity of the properties would not be so diminished as to disqualify any of them from NRHP eligibility.

Although the HRVEA identified 350 other above ground historic properties on mainland RI and MA within the visual APE of offshore Project components, BOEM has determined that either no effects or no adverse effects would result at these historic properties, based on the justifications provided in the HRVEA (see EDR 2022a:Attachment A). While their size and siting may afford many of these historic properties some view toward the Lease Area, for some these views will not be critical to their integrity and for others existing buildings, vegetation, and elements of the built environment result in limited, screened views. Existing buildings and infrastructure are also often accompanied by preexisting nighttime lighting that would reduce the visibility of farther off Project lighting. Visibility would be further minimized based on distance between onshore historic properties and offshore Project components. With increasing distances between historic properties and the RWF, atmospheric, environmental, and other obscuring factors, such as fog, haze, sea spray, wave height, and normal viewer acuity, serve to further minimize the visual intrusion posed by offshore WTGs. The ability of these 350 historic properties to convey the significance of their architectural and social history would be unaltered by the Project.

BOEM reviewed the assessment in the HRVEAs and CHRVEA and has determined that the Project would result in no adverse effects to any above ground historic properties identified in the visual APE beyond the 101 historic properties identified as adversely affected in Table 3.

5 Actions to Avoid, Minimize, or Mitigate Adverse Effects

As a requirement of COP approval, BOEM would stipulate the avoidance of historic properties identified in the APE and not currently found to be subject to adverse effects from the Project. This includes considering all prudent and feasible alternatives to avoid adverse effects on the NHLs, as discussed below.

For unavoidable adverse effects to historic properties, additional minimization and mitigation measures would be developed in consultation with the appropriate parties. This includes, to the maximum extent possible, taking such planning and actions as may be necessary to minimize harm to any NHL that may be directly and adversely affected by an undertaking.

Avoidance, minimization, and mitigation measures would be implemented through execution of an MOA by BOEM and the required signatories to resolve adverse effects under Section 106. Simultaneous to the release of this Finding, BOEM is releasing its *Draft Memorandum of Agreement Among the Bureau of Ocean Energy Management, the State Historic Preservation Officers of Connecticut, Massachusetts, New York, and Rhode Island, and the Advisory Council on Historic Preservation Regarding the Revolution Wind Farm and Revolution Wind Export Cable Project* for consulting party review. The MOA would be finalized and its requirements set by BOEM under NHPA Section 106 as a condition of BOEM's signing the record of decision (ROD), completing the NEPA review. Avoidance, minimization, and mitigation measures for historic properties are drafted in both the MOA and the historic property treatment plans attached to it. Under the MOA, adverse effects from the Project to historic properties, including NHLs, would be avoided, minimized, or mitigated in accordance with the NHPA Section 106 regulations (36 CFR 800) and in compliance with Section 110(f). The MOA also includes post-review discovery plans for onshore and offshore cultural resources, should previously undiscovered or unimpacted historic properties be identified. The post-review discovery plans would be implemented to assess and resolve any inadvertent adverse effects to these historic properties. Any historic properties that are discovered post-review, if adversely affected, would be resolved through the Section 106 consultation process detailed in these post-review discovery plans and the MOA.

5.1 Alternatives Considered

BOEM used the NEPA review process to consider a range of feasible alternatives to the maximum-case scenario of the Project's Proposed Action. That maximum-scenario would result in construction, operation, maintenance, and conceptual decommissioning of up to 100 WTGs and two OSS at the RWF. Alternatives considered would reduce the number of proposed WTGs. Analyses have found that reductions in WTG numbers will help minimize the adverse effects on above ground historic properties in the visual APE and ASFLs in the marine APE. However, no alternative meeting the purpose and need of Project development in the Lease Area would fully avoid adverse effects to historic properties, including from visual impacts to NHLs.

5.1.1 National Historic Landmarks

As the NPS (2021) conveys, "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… the agency should consider all prudent and feasible alternatives to avoid an adverse effect on the NHL.” The implementing regulations for Section 106 of the NHPA at 36 CFR 800.10 provide special requirements for protecting NHLs and complying with the NHPA Section 110(f).

BOEM has planned and is taking action to avoid adverse effects on NHLs in accordance with NHPA 110(f) and pursuant to The Secretary of the Interior’s Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (NPS 2021). Under all Project alternatives (BOEM 2021c), BOEM would avoid adverse effects to seven of the 12 NHLs in the visual APE: the Montauk Point Lighthouse, Original U.S. Naval War College Historic District, Fort Adams Historic District, Battle of Rhode Island Historic District, Nantucket Historic District, New Bedford Historic District, and William Watts Sherman House. This avoidance of adverse effects would be accomplished by taking advantage of existing obscuration, consisting of intervening factors such as curvature of the Earth, and atmospheric and environmental factors like fog, haze, sea spray, and intervening buildings, vegetation, and topography, which are enhanced with increasing distances between WTGs and historic properties. In addition, BOEM reviewed other NHLs in the vicinity, including the steamship *Sabino* in CT and the Newport Historic District in RI and determined these to not be in the APE. The *Sabino* only travels within 35 miles of the Project on tours and the Newport Historic District NHL, once distinguished from other adjoining historic district boundaries in the City of Newport, was found to be across Newport Neck from the Project without open ocean views of the RWF (EDR 2022a, 2022b).

BOEM has determined that five NHLs in RI would be adversely affected by the Project: Southeast Lighthouse on Block Island and Ocean Drive Historic District, Bellevue Avenue Historic District, The Breakers, and Marble House at Newport. BOEM has notified the NPS (as delegate of the Secretary of the Interior) and the ACHP of this determination with distribution of this Finding. The ACPH 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 on the Project on April 6 and April 29, 2021, respectively. 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 implementation of the special requirements outlined at 36 CFR 800.10 (BOEM 2021a).

Given the location of the lease and number of WTGs proposed, constraints on the necessary generation capacity for the project to be feasible, and the distance of the Lease Area to the shorelines of Block Island and Newport, BOEM determined that all feasible alternatives, including all feasible WTG layouts, would result in adverse visual effects on these five NHLs. Because of all these factors, the only alternative that BOEM was able to identify that avoids any Project effects on these NHLs was the no-action alternative. In the draft EIS, BOEM (2022a) has identified alternatives that reduce the number of WTGs by from the maximum-case scenario of the Proposed Action. While the differences between alternatives may be variable, alternatives for reduction in WTG numbers would all reduce visual effects on the NHLs and other adversely affected historic properties due to the fact that fewer WTGs would be constructed and therefore visible from above ground historic properties or as likely to necessitate the physical disturbance of ASLFs on the seafloor.

When prudent and feasible 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)" (NPS 2021). In this balancing, the NPS suggests that agencies 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" (NPS 2021). For the Project, the magnitude of the visual effects on the five NHLs is minimized by the distance between proposed offshore WTGs and the onshore NHLs and other factors (such as obscuring factors) limiting views between Project WTGs and the five NHLs. Moreover, while the undertaking would affect the historic setting of the NHLs, it would not affect other character-defining features or aspects of the NHL's historic integrity. The five NHLs, should the undertaking proceed, would still illustrate their regional and national significance, and continue to exemplify their national importance.

Through consultation, BOEM would refine minimization measures to the maximum extent feasible and further develop mitigation measures of adverse effects that remain at the five NHLs after the application of minimization efforts. BOEM would identify and finalize mitigation measures specific to each NHL with the consulting parties through development of the MOA. Mitigation measures for adverse effects to NHLs must be reasonable in cost and not be determined using inflexible criteria, as described by the NPS (2021). Mitigation of adverse effects to the five 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;
- 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).

5.1.2 Action Alternatives that Would Minimize the Adverse Effect of the Project

The Proposed Action (Alternative B) would construct, operate, maintain, and perceivably decommission up to 100 WTGs of 8 to 12 MW each and up to two OSS; whereas, Alternative C (Habitat Alternative) would include 64–65 WTGs, Alternative D (Transit Alternative) would include 78–93 WTGs, Alternative E (Viewshed Alternative) would include 64–81 WTGs, and Alternative F (Higher Capacity Turbine Alternative) would combine with any of the other action alternatives to use 14 MW WTGs within the PDE of the 12 MW WTGs to reduce the overall numbers down to as few as 56 WTGs (see Table 4).

5.1.2.1 Minimization of Visual Adverse Effect

Reduction in WTG numbers was analyzed in the draft EIS to have the following opportunities to reduce visual impacts to above ground historic properties, which would additionally minimize harm to NHLs. Compared to the maximum-case scenario under the Proposed Action, Alternatives C through F could decrease impacts to historic properties from visibility of offshore wind structures and from the construction and installation lighting on these structures because the number of constructed WTGs and their viewshed would be reduced in the following manners (see BOEM 2022a:Table 3.10-7).

WTG structure and lighting visibility would be reduced from up to 100 WTGs under the Proposed Action to:

- 64 or 65 WTGs (up to 35% to 36% less, respectively) under Alternative C.
- 78 to 93 WTGs (up to 7% to 22% less) under Alternative D. These visual impacts under Alternative D would remain greater than those of Alternative C. Alternative D3 would specifically remove the closest seven WTG locations to Block Island and have an increased advantage for reducing visual impacts on above ground historic properties on the shores of that island over other action alternatives, except Alternative E2, which would remove even more WTGs on the Block Island side of the RWF.
- 64 to 81 WTGs (up to 36% to 19% less) under Alternative E. The Alternative E1 configuration, in particular, would reduce the proximity of WTGs to Martha's Vineyard and toward mainland RI. Alternative E2 would remove the closest WTGs to Martha's Vineyard and be most advantageous for reducing WTG proximity to Block Island; however, it would not be as effective overall as Alternative E1 for reducing WTG proximity to onshore areas. Although the distance of WTGs from Martha's Vineyard would increase under Alternative E specifically compared to other alternatives, the total number of WTG impacts would remain greater than those of Alternative C and would reach the potential lower WTG numbers and impacts of Alternative D. Alternative E is primarily focused on setbacks of WTGs from Martha's Vineyard and would effectively increase distances of Project WTGs to historic properties there, especially under Alternative E1. This especially includes increased setbacks from historic properties important to Tribal Nations at Aquinnah, inclusive of the Edwin DeVries Vanderhoop Homestead, Gay Head Light, and Gay Head - Aquinnah Shops. Alternative E also further increases setbacks from Newport and Block Island, including the Breakers, Marble House, and the Ocean Drive Historic District, Bellevue Avenue Historic District, and Southeast Lighthouse NHLs. The Alternative E setbacks for RWF WTGs would increase the distances to historic properties at Aquinnah by between approximately 0.25 and 1 mile, at Newport and mainland RI by approximately 4 miles, and at Block Island variably beginning at less than 1 mile and extending to over 4 miles. Therefore, Alternative E would be more effective in reducing visual impacts from the nearest potential WTGs to historic properties at Martha's Vineyard, MA, and along RI shores compared to other action alternatives but would not eliminate visual impacts to all historic properties and would not result in fewer visible WTGs and offshore RWF lighting sources than Alternatives C or F.
- as few as 56 WTGs (up to 44% less than the maximum of 100 WTG under the Proposed Action) under Alternative F when combined with any of the action alternatives (C1, C2, or E1) intended to allow for the fulfillment of the existing three PPAs' generation requirement of at least 704 MW. These WTG impacts under Alternative F could potentially be reduced from those of the other action alternatives, where WTG numbers are comparatively less.

Although reduced, the layout modification and construction activities proposed under Alternatives C through F would still include the same historic properties adversely affected under the Proposed Action and the same potential for impacts to these historic properties. Portions of all RWF WTGs would potentially be visible from approximately most of the 101 historic properties adversely affected under the action alternatives. All action alternatives, regardless of planned WTG numbers, would have the WTG visibility reduced somewhat due to intervening land areas and with setback distance from the coastline. As described, those action alternatives with the fewest WTGs and the greatest distances of setback would have the least degree of potential visual adverse effects on historic properties. Under Alternatives C through F, the construction and installation of offshore Project components with lighting would have adverse effects to historic properties, similar to those of the Proposed Action. O&M and decommissioning of offshore Project components with lighting would have effects to historic properties under Alternatives C through F, similar to those of the Proposed Action. Visual effects from offshore Project components' lighting would be removed upon completion of decommissioning.

To the potential 955 WTGs modeled in a maximum-case scenario for other future offshore wind activities (EDR 2021b), Alternatives C through F would add visual effects from offshore WTG structure visibility and lighting, including from navigational and aviation hazard lighting systems. The same 101 historic properties would continue to be adversely affected by offshore structure lighting visibility in the visual APE under Alternatives C through F as under the Proposed Action. The cumulative visual effects of offshore structures and lighting on historic properties in the visual APE associated with Alternatives C through F when combined with past, present, and reasonably foreseeable activities would be long term and adverse, until decommissioning of the Project. However, for Alternative E, the visual proximity for effects from offshore Project elements would specifically have increased setbacks from historic properties at Martha's Vineyard, MA, and the nearest shores of RI (including NHLs at Newport).

5.1.2.2 Minimization of Physical Effects to ASLF from Seafloor Disturbance

Alternatives C through F would involve the same types or numbers of submerged historic properties on the seafloor at the RWF and RWEC offshore development areas as under the Proposed Action. However, these alternatives could decrease the risk of disturbance and impacts to historic properties because the number of constructed WTGs could be reduced and associated cable trenching could also decrease, resulting in greater Project flexibility for avoiding these historic properties. Therefore, RWEC and RWF WTG and IAC construction, operation, maintenance, decommissioning, and associated vessel anchoring would result in less seafloor disturbance than is anticipated for the Proposed Action (see BOEM 2022a:Table 3.10-7).

Potential construction disturbance for WTG and OSS locations is expected to reduce from the maximum scenario of 734.4 acres of Alternative B to 475.2-482.4 acres under Alternative C, 576-684 acres under Alternative D, 475.2-597.6 acres under Alternative D, and as little as 417.6 acres under Alternative F (BOEM 2022a:Table E4-1). The IAC length and acreage of disturbance between WTG would reduce comparatively. Potential anchorage disturbance is expected to reduce from the 3,178 acres of Alternative B to 2,062-2,093 acres under Alternative C, 2,496-2,961 acres under Alternative D, 2,062 or 2,589 acres under Alternative D, and as little as 1,814 acres under Alternative F (BOEM 2022a:Table E4-1).

Compared to the Prosed Action, Alternative C would place WTG locations farther from seven of the 29 historic properties in the marine APE, specifically 2.8 to 3.0 miles farther from ASLF Target-28 and Target-27, respectively and 0.25 mile to 2.5 miles farther from shipwrecks/possible historic shipwreck Target-02, Target-08, Target-17, Target-18, and Target-19, in order of increasing distance. Distances to other submerged historic properties in the marine APE would not change under Alternative C.

Alternative D would decrease the risk of disturbance and impacts at one potential shipwreck (Target 04) because the nearest WTG would be sited approximately 3.5 miles more distant from that shipwreck. Impacts would remain the same as the Proposed Action, however, if Alternative D retains WTG proximity to that shipwreck. As a result, Alternative D would not have the potential to reduce potential for adverse effects at submerged historic properties as much as Alternative C. Alternative D would also maintain similar configurations to the Proposed Action at the other 28 ASLFs and shipwrecks/possible historic shipwrecks in the marine APE.

Compared to the Proposed Action, the 64 WTG configuration of Alternative E1 would place WTG locations farther from seven of the 29 ASLFs and shipwrecks/possible historic shipwrecks in the marine APE. These seven consist of two ASLF (Target-24 and Target-26), three known shipwrecks (Target-01, Target-06, and Target-09), and two possible historic shipwrecks (Target-07 and Target-16). Compared to the Proposed Action, the 81 WTG configuration of Alternative E2 would place WTG locations farther from one ASLF (Target-24) and one possible historic shipwreck (Target-09). Either configuration of Alterative E would have more potential for adverse effects at submerged historic properties than Alternative C but less potential for adverse effects than either Alternative D or the Proposed Action. However, Alternative E would increase the distance of Project WTGs to a different range of submerged historic properties than either Alternative C or Alternative D. Alternative E would result in similar effects to the Proposed Action at the 22 to 27 historic properties in the marine APE where its configurations do not provide farther avoidance distances.

Seafloor disturbance associated with Alternative F, which combines alternative WTG reduction options, would result in less seafloor disturbance than is anticipated for the Proposed Action or, potentially, the other action alternatives.

Alternatives C through F would use the same RWEC as that of the Proposed Action. These alternatives would result in irreversible adverse effects to historic properties where seafloor disturbance would not be avoidable at them during construction of the RWEC.

Due to the similarity in Project activities and locations, the impacts of seafloor disturbance on identified ASLFs and shipwrecks/possible historic shipwrecks from Project operations, maintenance, and decommissioning activities associated with Alternatives C through F would be similar to the Proposed Action. Seafloor disturbance, including shipwrecks and ASLF, would be negligible (not adverse) during operations and maintenance, because these activities would be restricted to areas that have been surveyed and found to contain no marine cultural resources or that have previously experienced disturbance during construction. Decommissioning activities would be expected to take place in previously disturbed areas and therefore not adverse at historic properties. Overall, the reduced scale of Alternatives C through F would result in fewer potential effects from seafloor disturbance activities than the Proposed Action.

5.2 Avoidance, Minimization, and Mitigation Measures

The Section 106 process requires BOEM to seek ways to avoid, minimize, or mitigate the adverse effects of the Project 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. BOEM would then implement minimization to reduce the adverse effect to the extent able. All adverse effects remaining after avoidance and minimization measures would be mitigated. Mitigation measures for historic properties, including NHLs, would be stipulated in the MOA and detailed in the historic property treatment plans attached to the MOA. These same mitigation measures, committed to by

Revolution Wind in the MOA and identified in COP Appendix BB – Cultural Resources Avoidance, Minimization, and Mitigation Measures (EDR 2022c), would also be incorporated by BOEM into COP approval.

BOEM remains in consultation with all consulting parties under Section 106 of the NHPA, including Tribal Nations that may have concerns for properties of traditional cultural and religious significance in the APE; State Historic Preservation Offices/Division for Historic Preservation; ACHP; NPS; and other cooperating federal agencies, local governments, historical interest groups, and involved property owners. BOEM will continue to consult with these parties on this Finding and the resolution of all adverse effects. Consistent with the provisions for NEPA substitution, pursuant to 36 CFR 800.8(c)(4)(i)(A), BOEM will codify the resolution of adverse effects through the MOA for the Project.

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APPENDIX A

Area of Potential Effects Map Figures

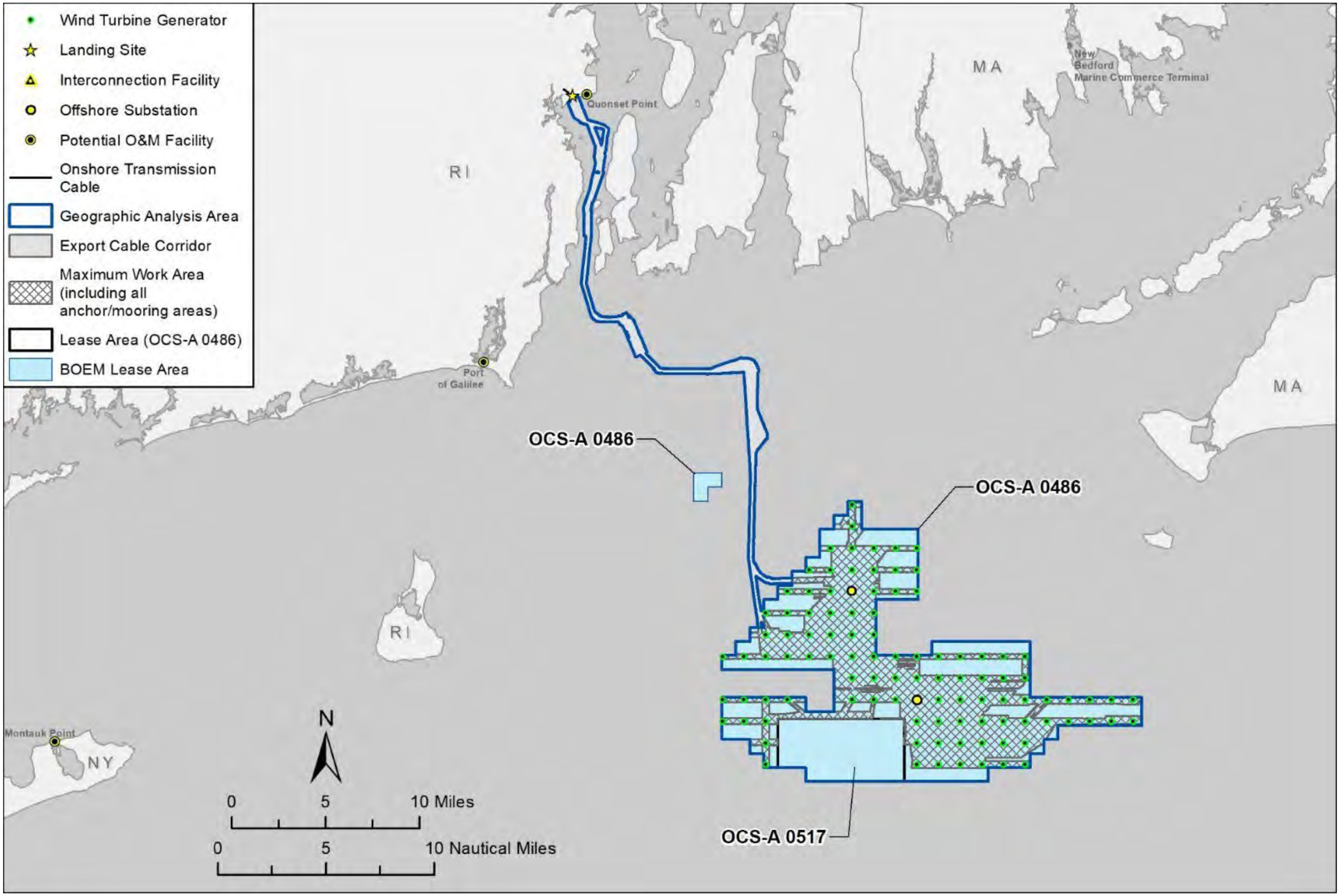


Figure A-1. Revolution Wind construction and operations plan proposed offshore Project elements.

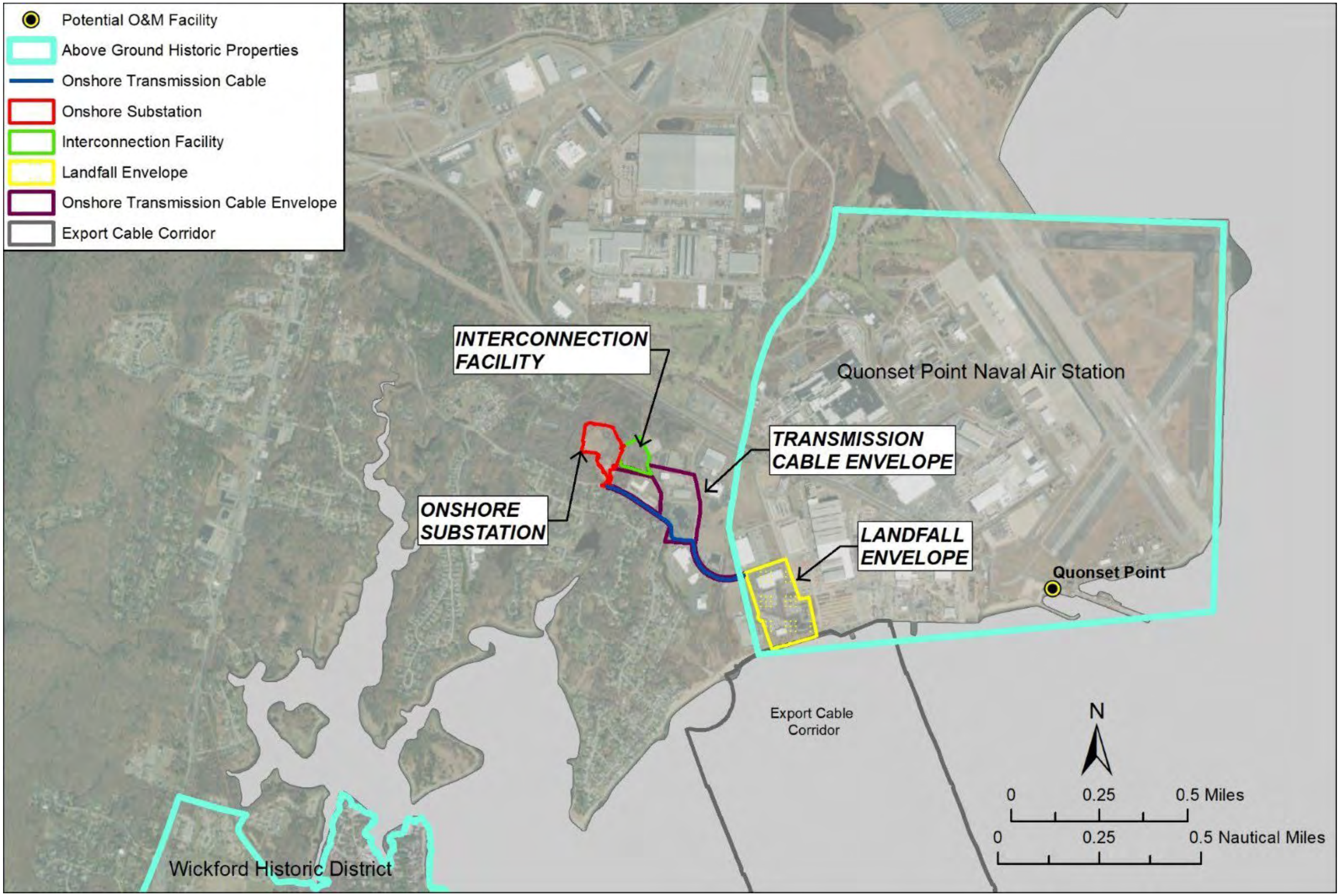


Figure A-2. Revolution Wind construction and operations plan proposed onshore Project elements.

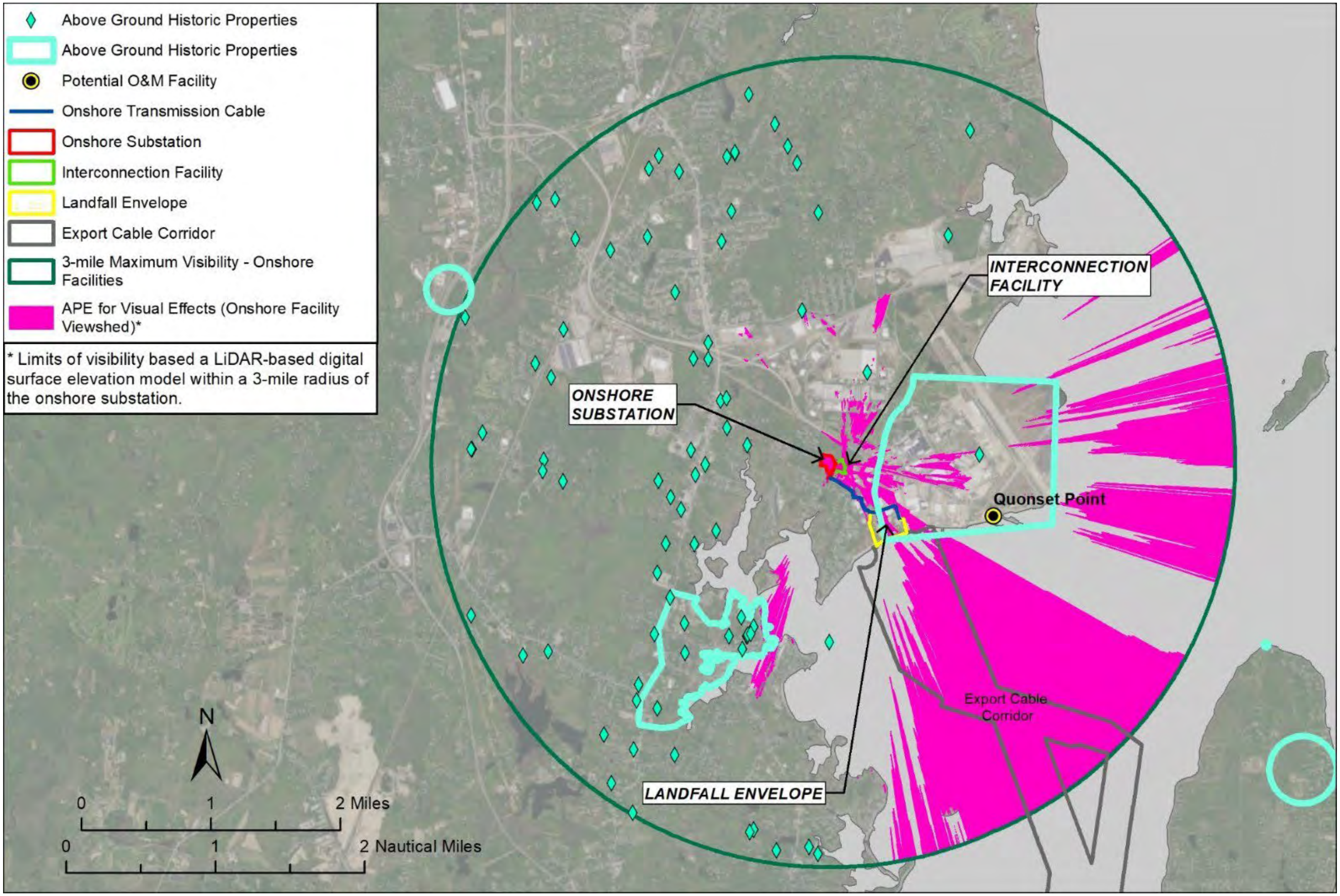


Figure A-3. Visual area of potential effects and visual effects assessment geographic analysis area – onshore.

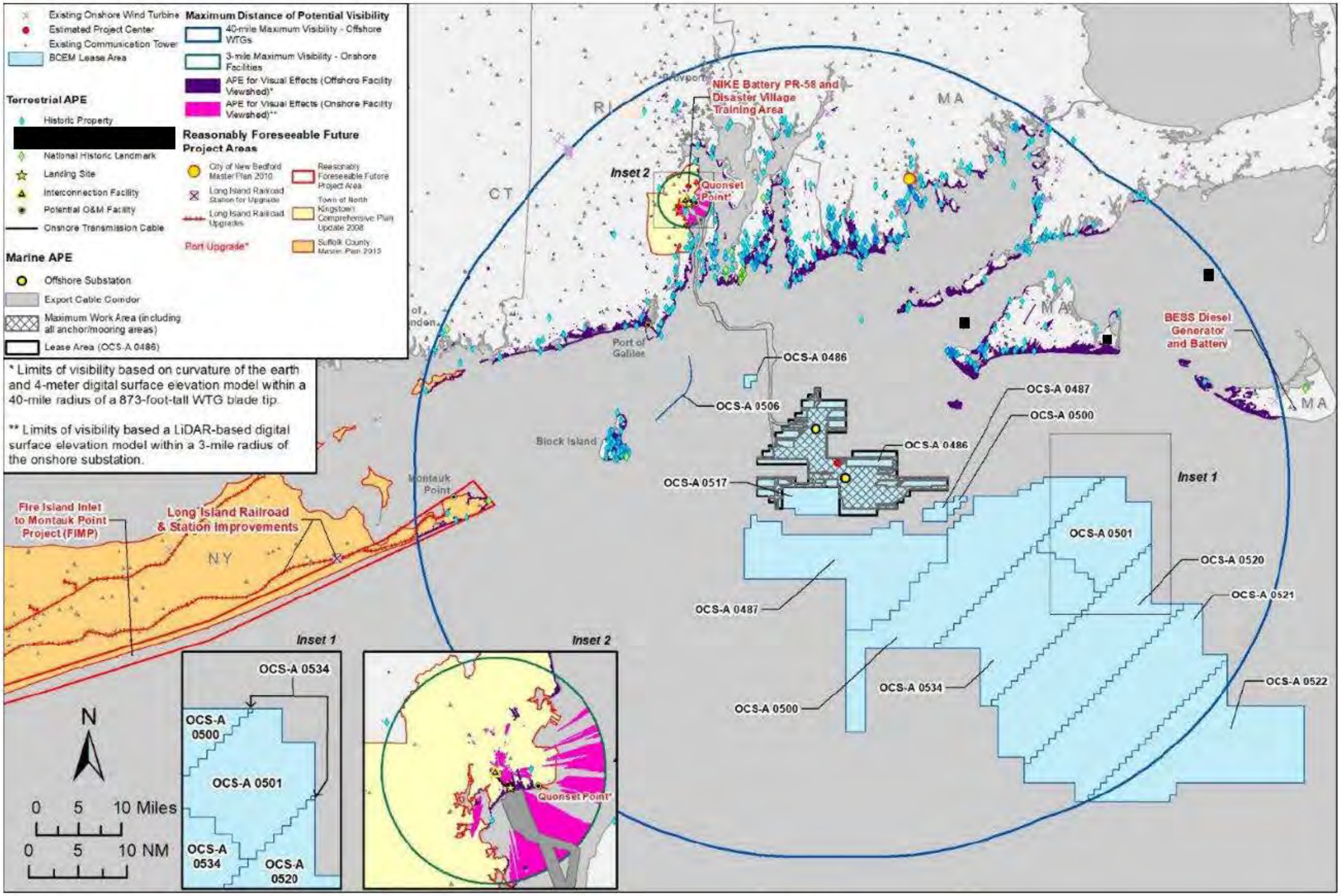


Figure A-4. Visual area of potential effects and visual effects assessment geographic analysis area – offshore.

APPENDIX B

Map Figures of Historic Properties in Relation to the Area of Potential Effects

(detached – contains material that meets the criteria for confidentiality under Section 304 of the NHPA)

APPENDIX C

Visual Simulations at the Pertinent Key Observation Points for Adversely Affected National Historic Landmarks

Revolution Wind | Powered by Ørsted & Eversource

Environmental Data
Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 22.8 feet AMSL

Key Observation Point Information
County: Newport
Town: Newport
State: Rhode Island
Location: Aquidneck Island
Latitude, Longitude: 41.45119° N, 71.31157° W
Direction of View (Center): South-Southeast (155.7°)
Field of View: 124° x 55°

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Shoreline Residential
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

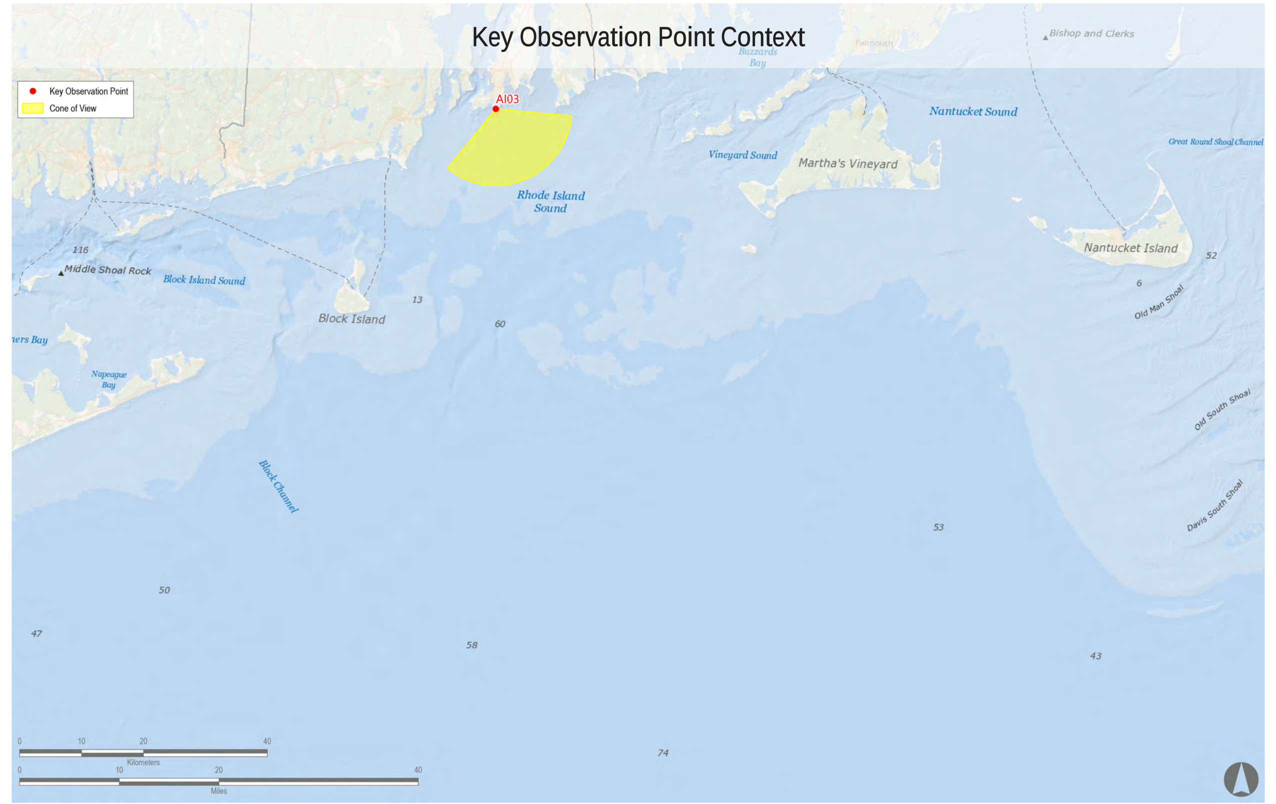
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

AI03: Newport Cliff Walk, Newport, Rhode Island Existing Conditions

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama



Revolution Wind | Powered by Ørsted & Eversource

AI03: Newport Cliff Walk, Newport, Rhode Island

Visual Simulation: 2023 Project Construction (South Fork Wind and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 22.8 feet AMSL

Key Observation Point Information
County: Newport
Town: Newport
State: Rhode Island
Location: Aquidneck Island
Latitude, Longitude: 41.45119° N, 71.31157° W
Direction of View (Center): South-Southeast (155.7°)
Field of View: 124° x 55°

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Shoreline Residential
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
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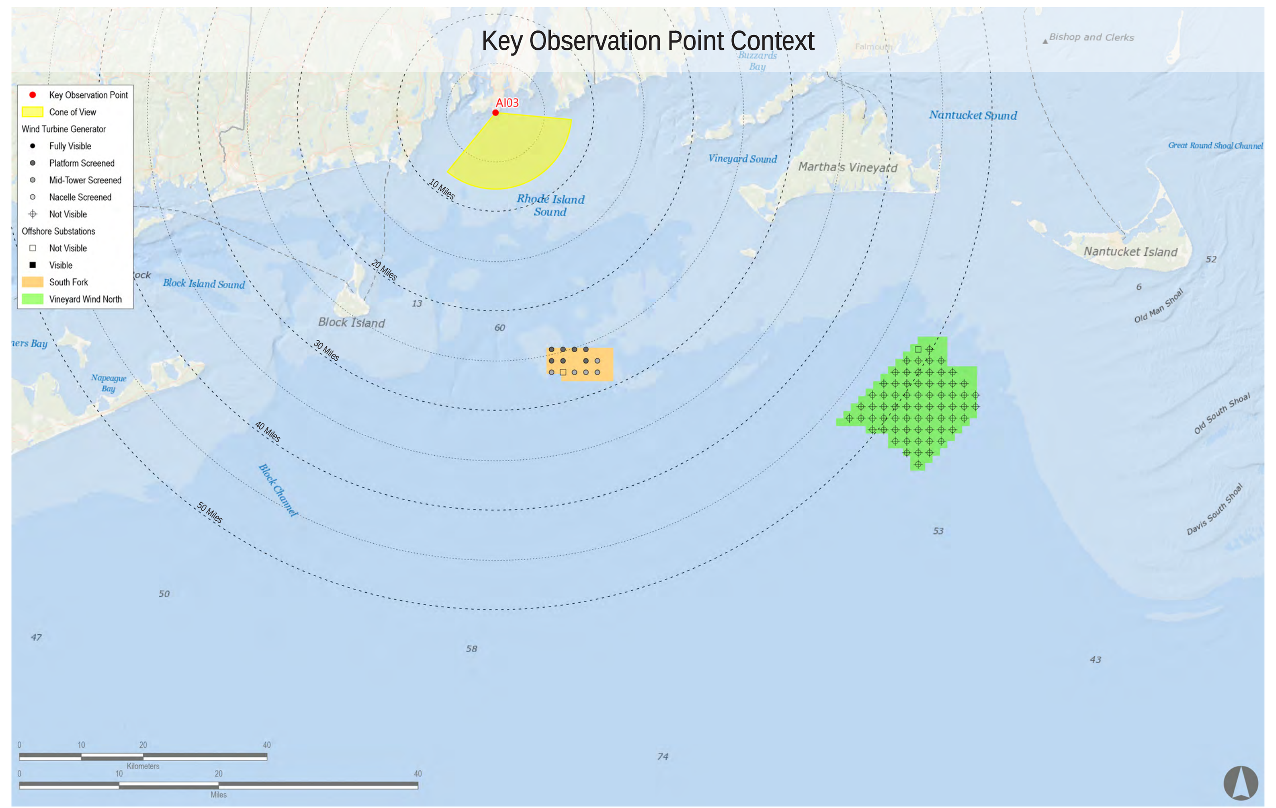
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	12	13	24.5	28.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA



Revolution Wind | Powered by Ørsted & Eversource

AI03: Newport Cliff Walk, Newport, Rhode Island

Visual Simulation: 2023 Project Construction with Revolution Construction added (Revolution Wind, South Fork Wind, and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

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Visual Resources

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Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

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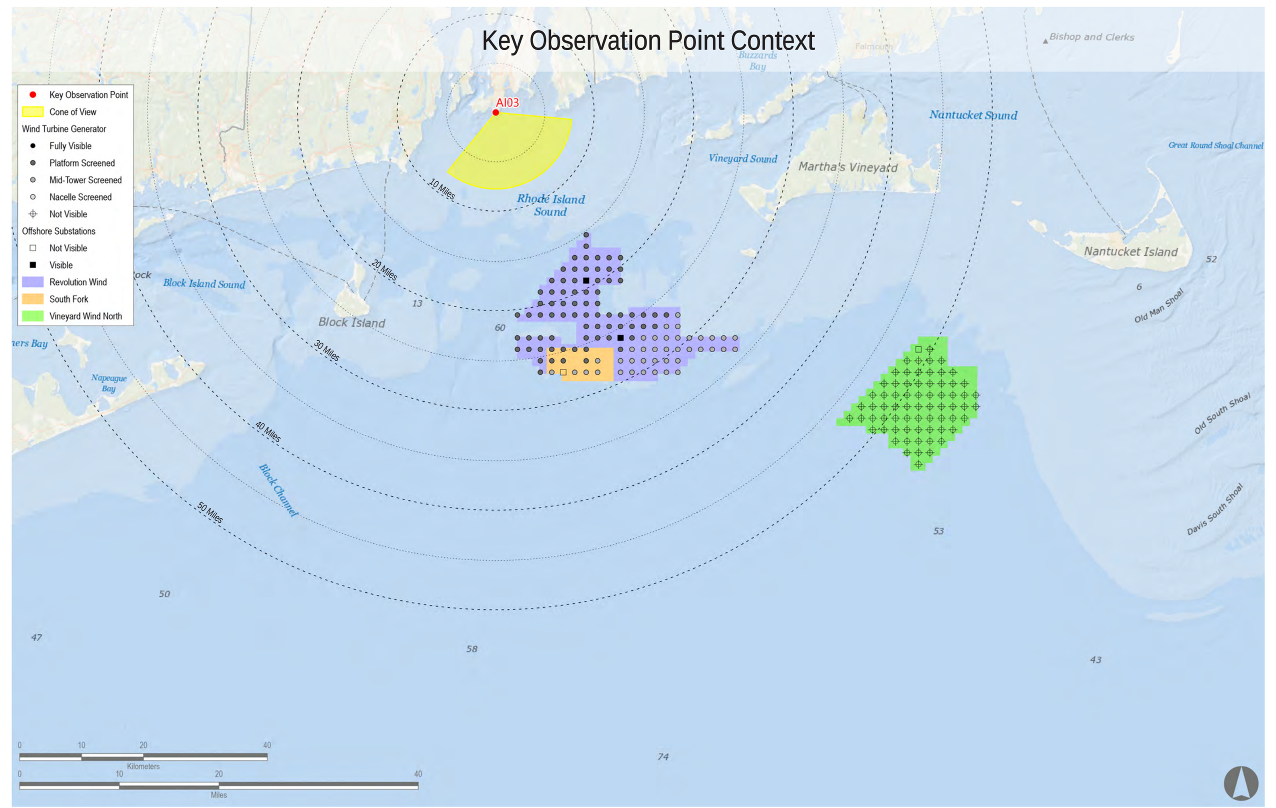
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	12	13	24.5	28.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA
Revolution Wind	2023	12 MW	102	102	15.3	33.8



Revolution Wind | Powered by Ørsted & Eversource

AI03: Newport Cliff Walk, Newport, Rhode Island

Visual Simulation: Full Lease Build-out Including Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 22.8 feet AMSL

Key Observation Point Information

County: Newport
Town: Newport
State: Rhode Island
Location: Aquidneck Island
Latitude, Longitude: 41.45119° N, 71.31157° W
Direction of View (Center): South-Southeast (155.7°)
Field of View: 124° x 55°

Visual Resources

Landscape Similarity Zone: Maintained Recreation Area, Shoreline Residential
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

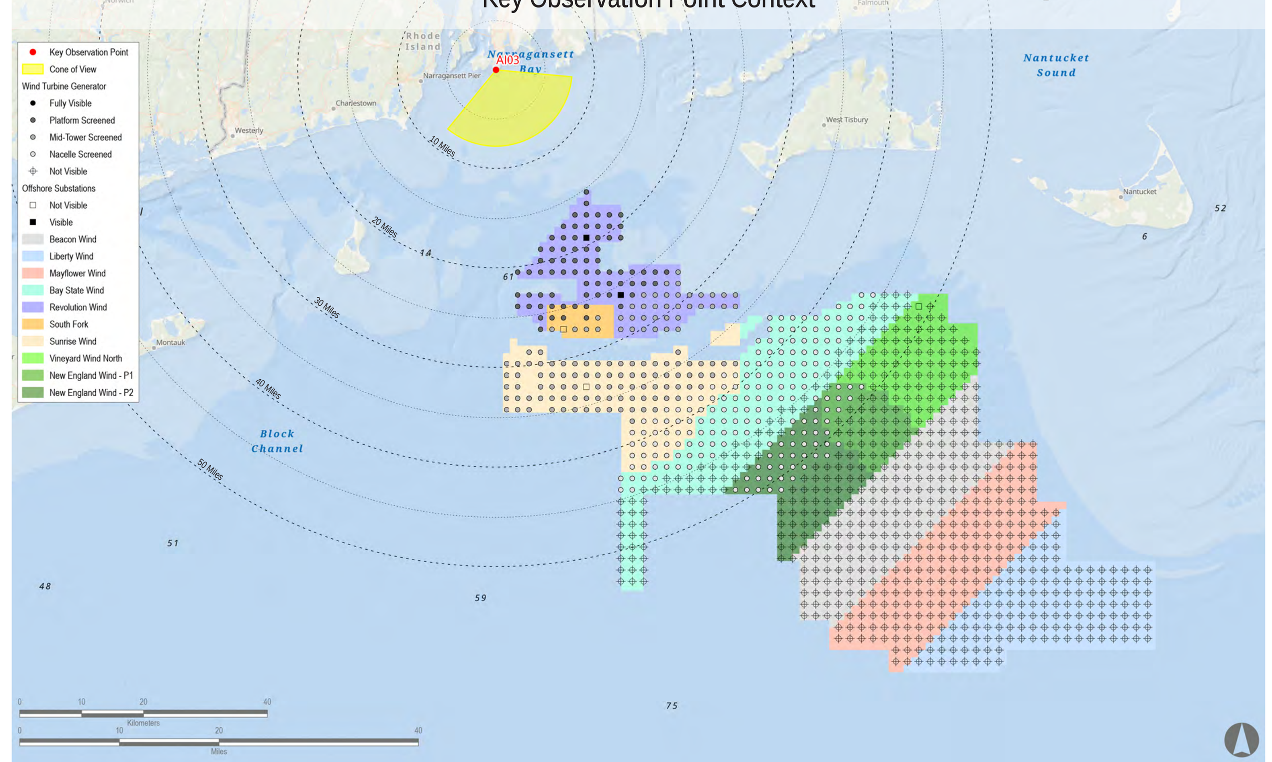
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

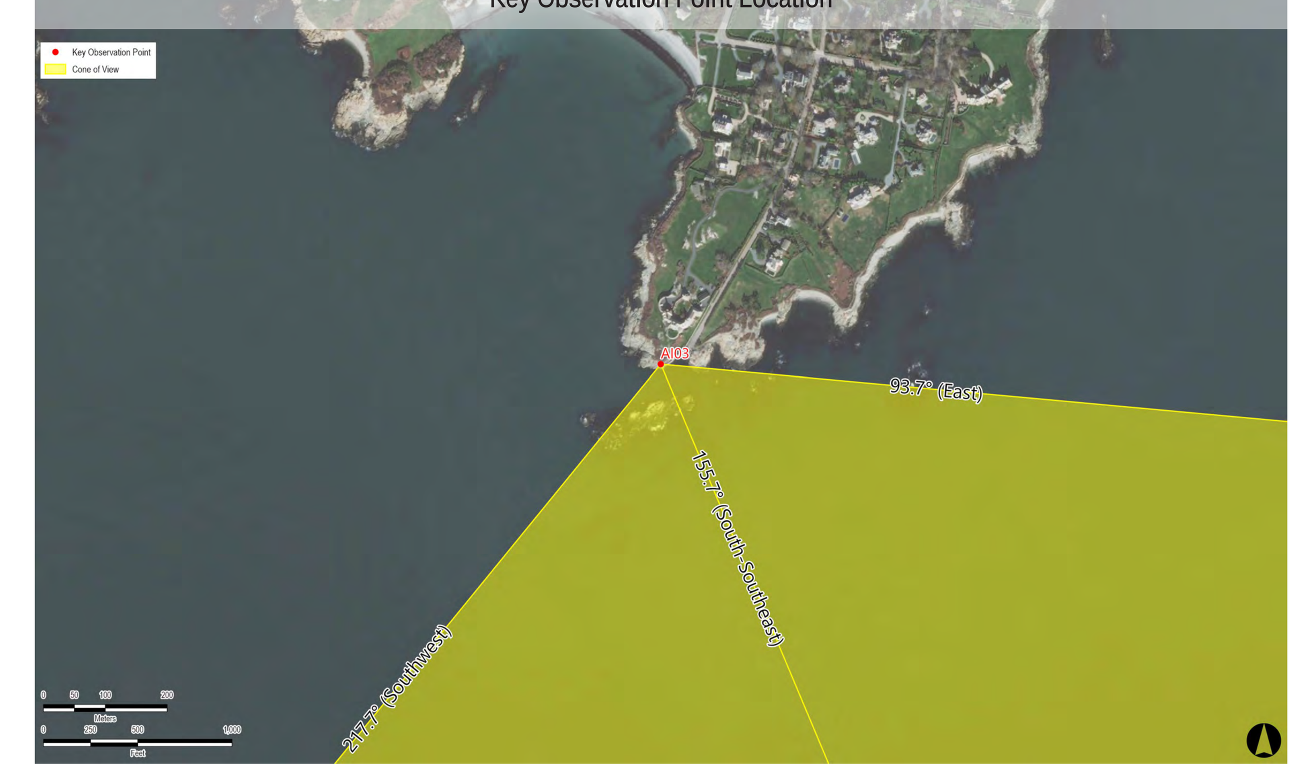
Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	12	13	24.5	28.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA
Revolution Wind	2023	12 MW	102	102	15.3	33.8
New England Wind Phase 1	2024	16 MW	9	41	46.8	48.6
New England Wind Phase 2	2024	19 MW	37	79	46.0	51.1
Sunrise Wind	2024	15 MW	122	123	28.6	42.6
Mayflower Wind	2024	12 MW	0	149	NA	NA
Liberty Wind	2025-2030	12 MW	0	139	NA	NA
Beacon Wind	2025-2030	12 MW	0	157	NA	NA
Bay State Wind	2025-2030	12 MW	100	185	37.1	44.5

Key Observation Point Context



Key Observation Point Location



Revolution Wind | Powered by Ørsted & Eversource

AI03: Newport Cliff Walk, Newport, Rhode Island

Visual Simulation: Full Lease Build-out Excluding Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 22.8 feet AMSL

Key Observation Point Information

County: Newport
Town: Newport
State: Rhode Island
Location: Aquidneck Island
Latitude, Longitude: 41.45119° N, 71.31157° W
Direction of View (Center): South-Southeast (155.7°)
Field of View: 124° x 55°

Visual Resources

Landscape Similarity Zone: Maintained Recreation Area, Shoreline Residential
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
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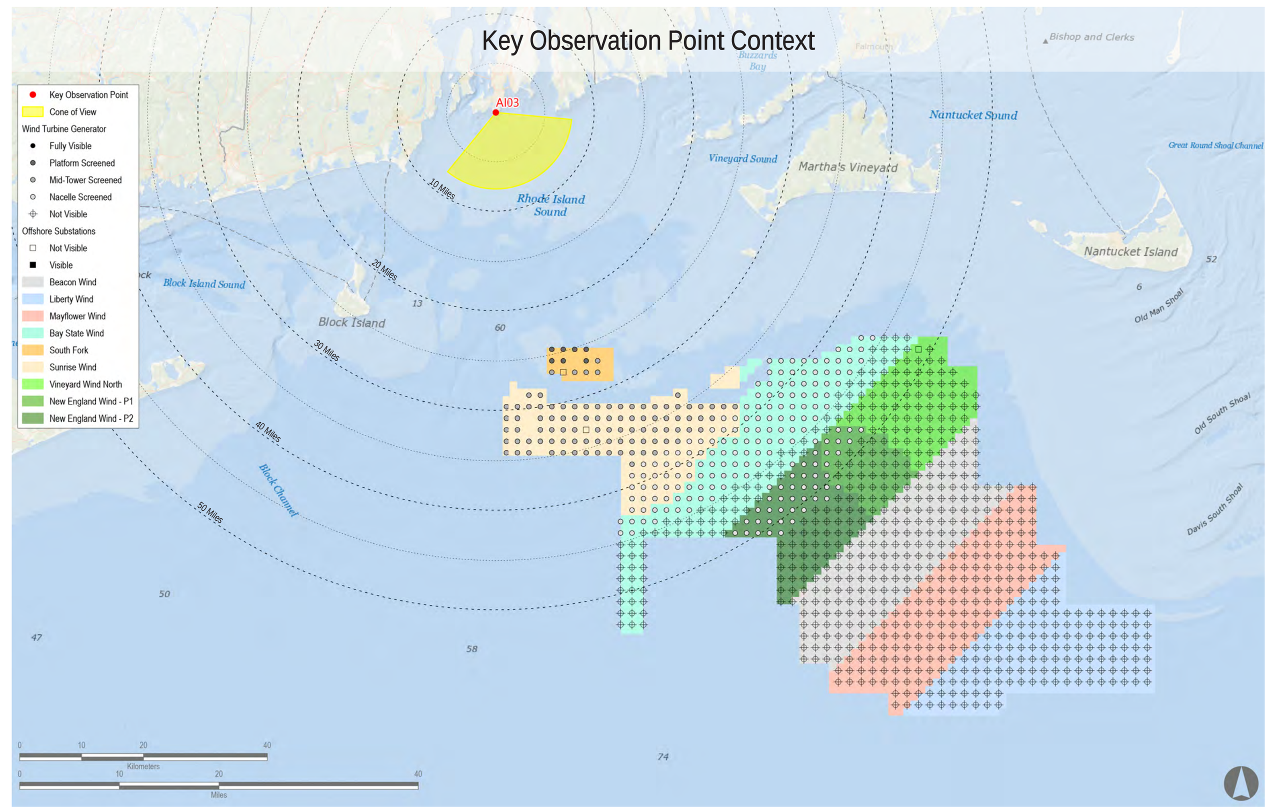
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	12	13	24.5	28.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA
New England Wind Phase 1	2024	16 MW	9	41	46.8	48.6
New England Wind Phase 2	2024	19 MW	37	79	46.0	51.1
Sunrise Wind	2024	15 MW	122	123	28.6	42.6
Mayflower Wind	2024	12 MW	0	149	NA	NA
Liberty Wind	2025-2030	12 MW	0	139	NA	NA
Beacon Wind	2025-2030	12 MW	0	157	NA	NA
Bay State Wind	2025-2030	12 MW	100	185	37.1	44.5



Revolution Wind

Powered by Ørsted & Eversource

AI03: Newport Cliff Walk, Newport, Rhode Island

Visual Simulation: Revolution Wind Without Other Foreseeable Future Changes

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 7/26/2017
Time: 7:03 AM
Temperature: 59°F
Humidity: 96%
Visibility: >10 miles
Wind Direction: Calm
Wind Speed: 0 mph
Conditions Observed: Fair

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 22.8 feet AMSL

Key Observation Point Information

County: Newport
Town: Newport
State: Rhode Island
Location: Aquidneck Island
Latitude, Longitude: 41.45119° N, 71.31157° W
Direction of View (Center): South-Southeast (155.7°)
Field of View: 124° x 55°

Visual Resources

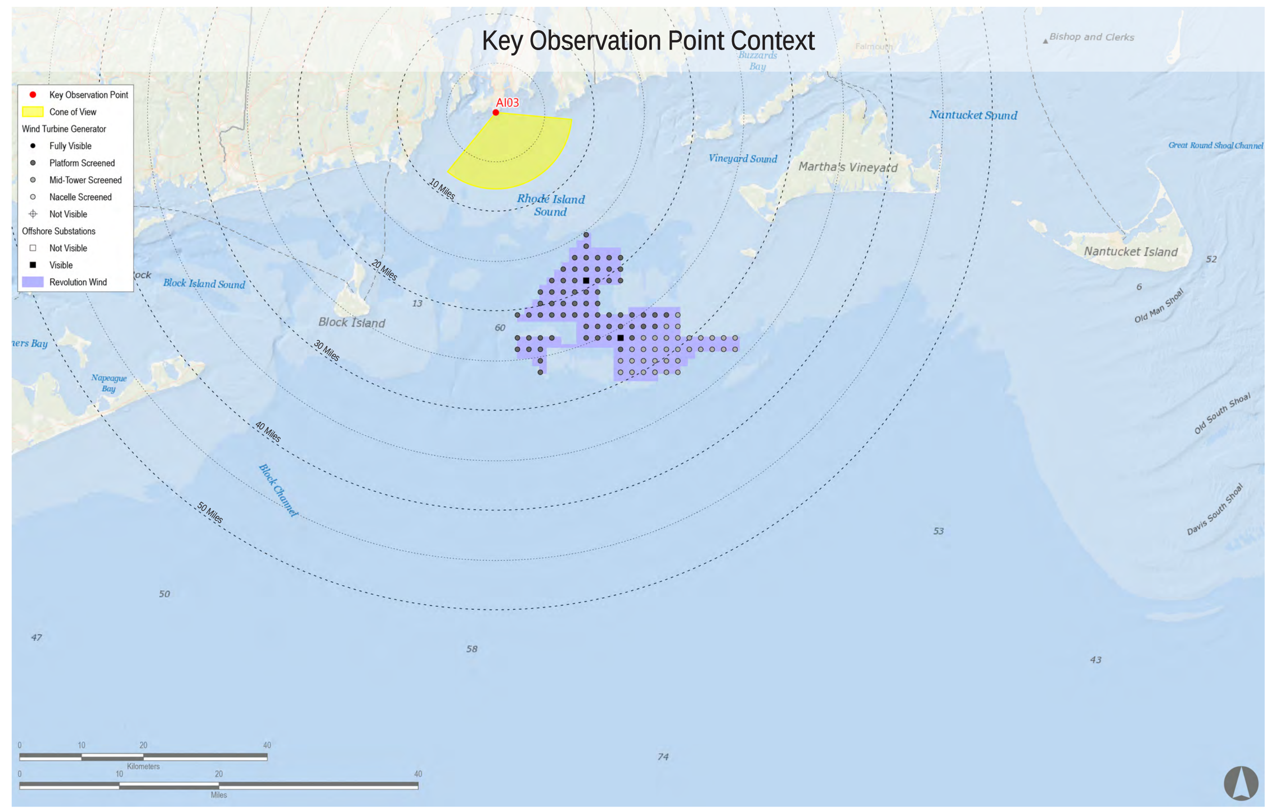
Landscape Similarity Zone: Maintained Recreation Area, Shoreline Residential
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Newport/Ocean Drive State Scenic Area, Cliff Walk National Recreation Trail, Newport National Historic Landmark

Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
Revolution Wind	2023	12 MW	102	102	15.3	33.8



Revolution Wind | Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Existing Conditions

Environmental Data
Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

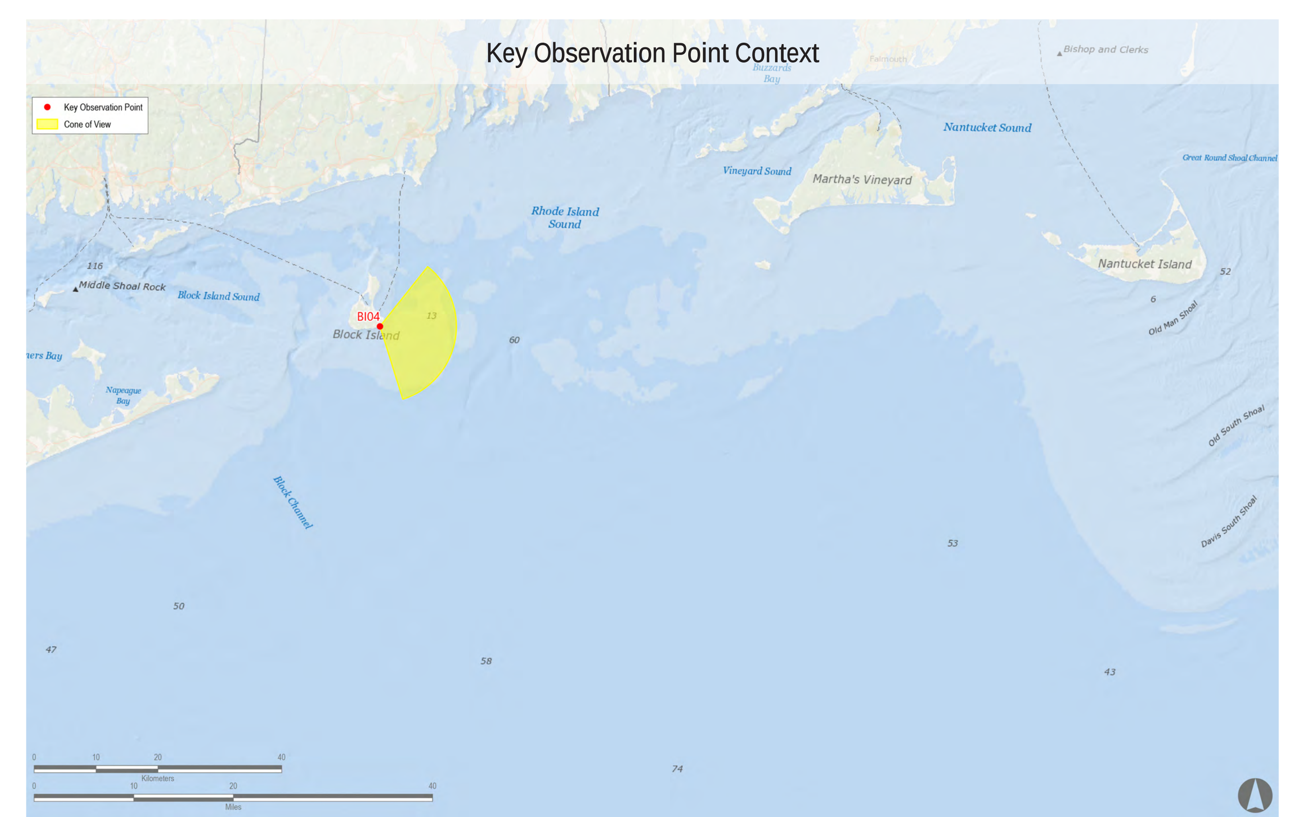
Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

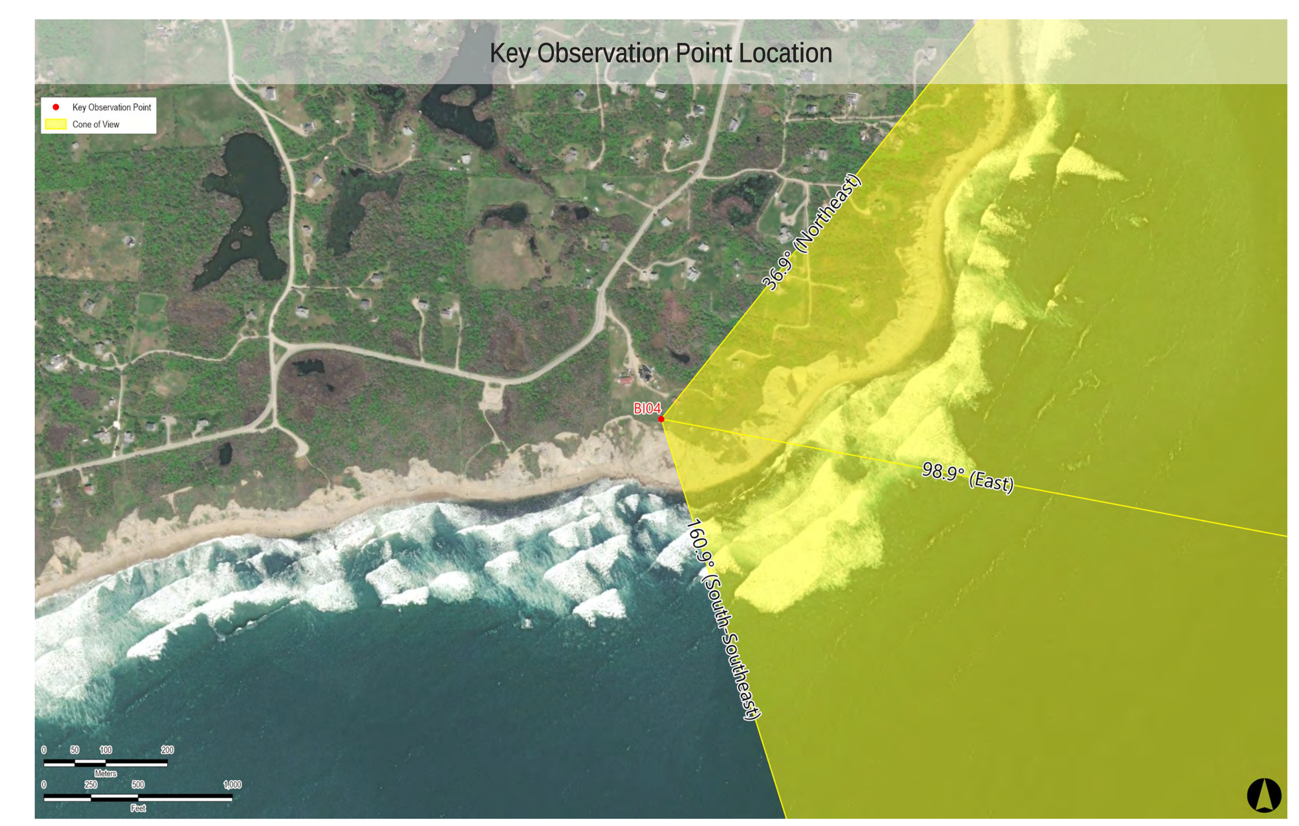
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Key Observation Point Context



Key Observation Point Location



Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Revolution Wind | Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: 2023 Project Construction (South Fork Wind and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

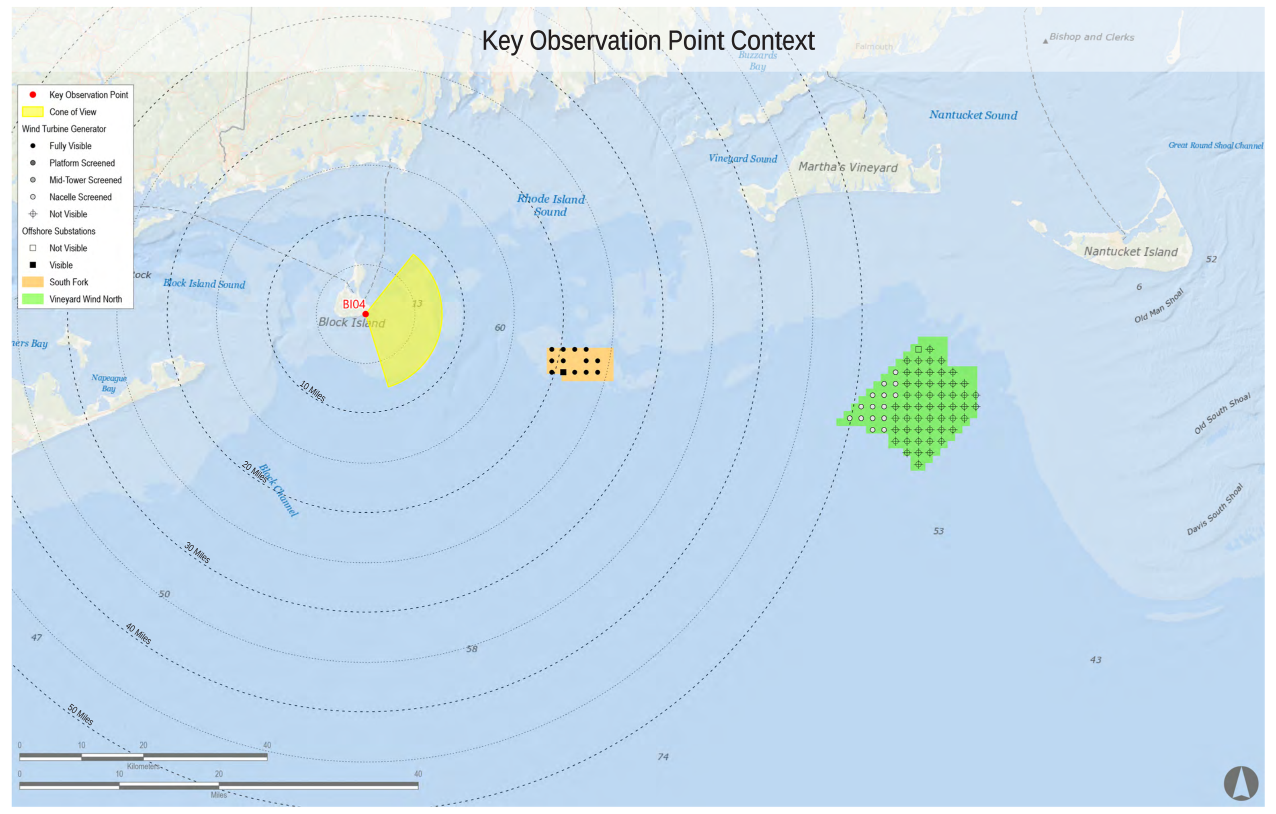
Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

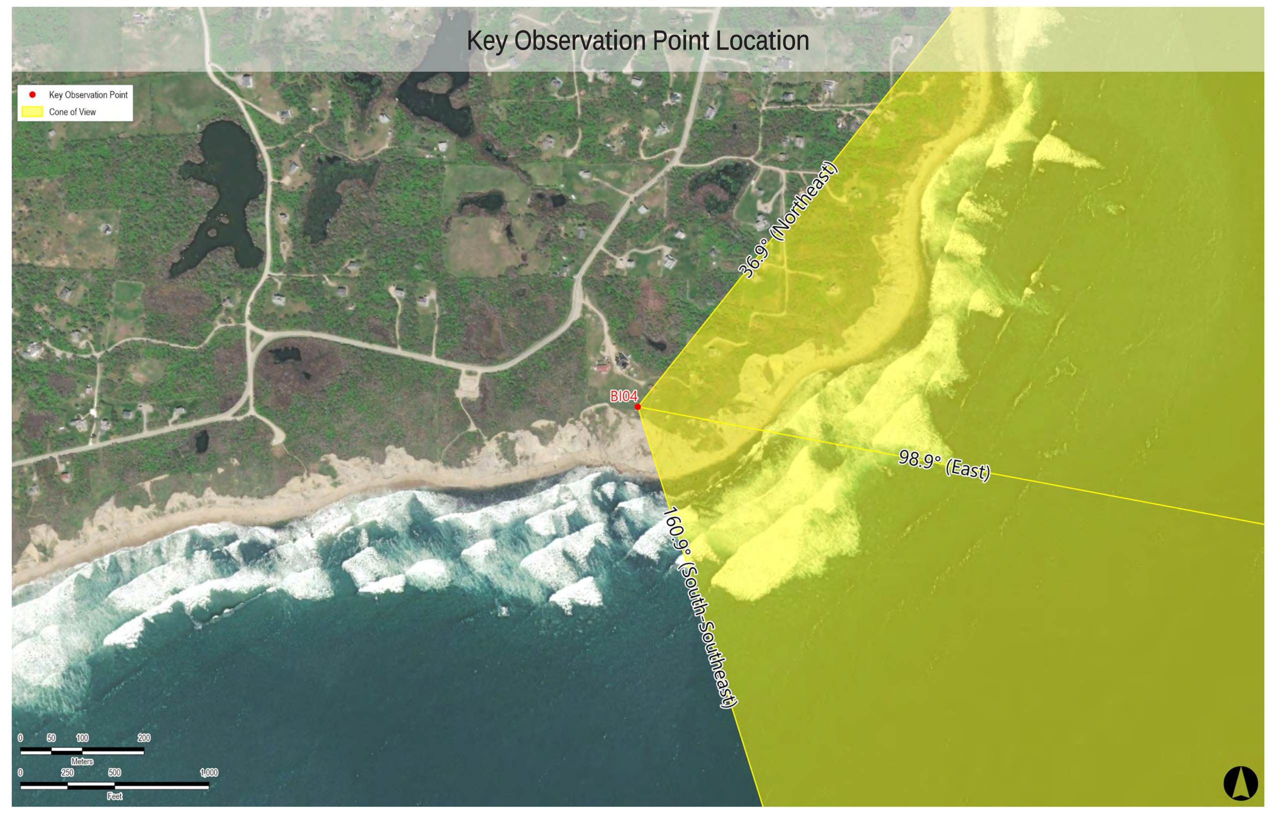
Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:
- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	13	13	19.0	24.0
Vineyard Wind North	2023	14 MW	15	69	49.6	53.7





Revolution Wind | Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: 2023 Project Construction with Revolution Construction added (Revolution Wind, South Fork Wind, and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

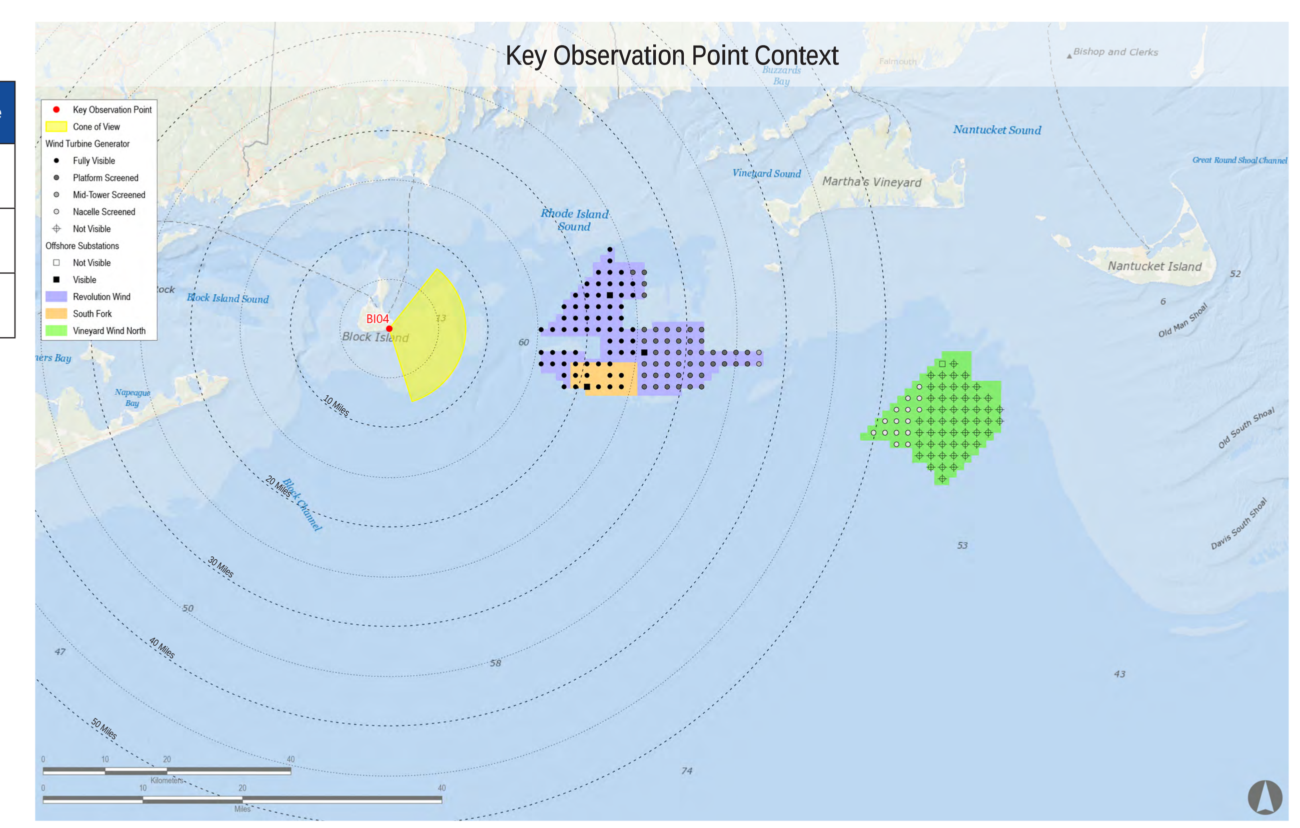
Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

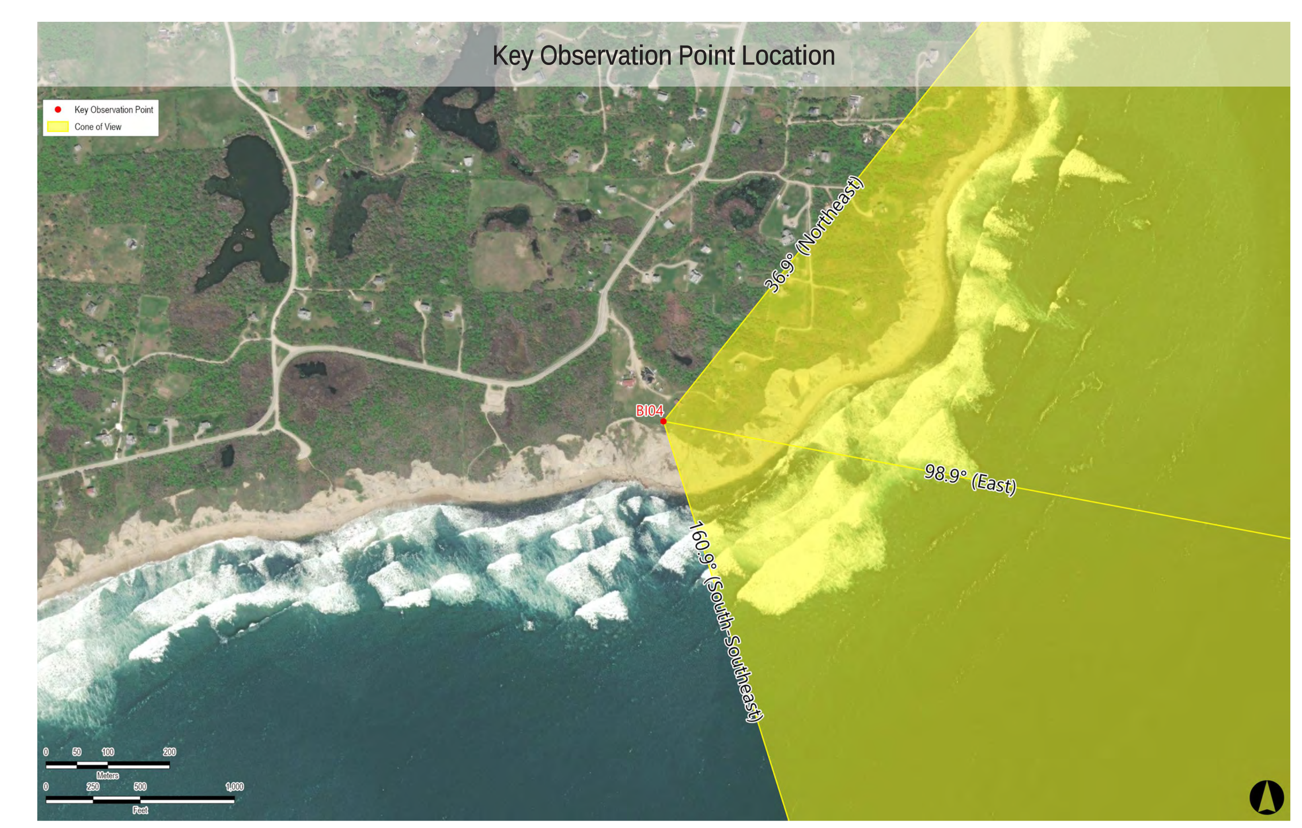
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	13	13	19.0	24.0
Vineyard Wind North	2023	14 MW	15	69	49.6	53.7
Revolution Wind	2023	12 MW	102	102	15.2	37.2





Revolution Wind | Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Full Lease Build-out Including Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Key Observation Point Information

County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Visual Resources

Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:

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- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
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Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
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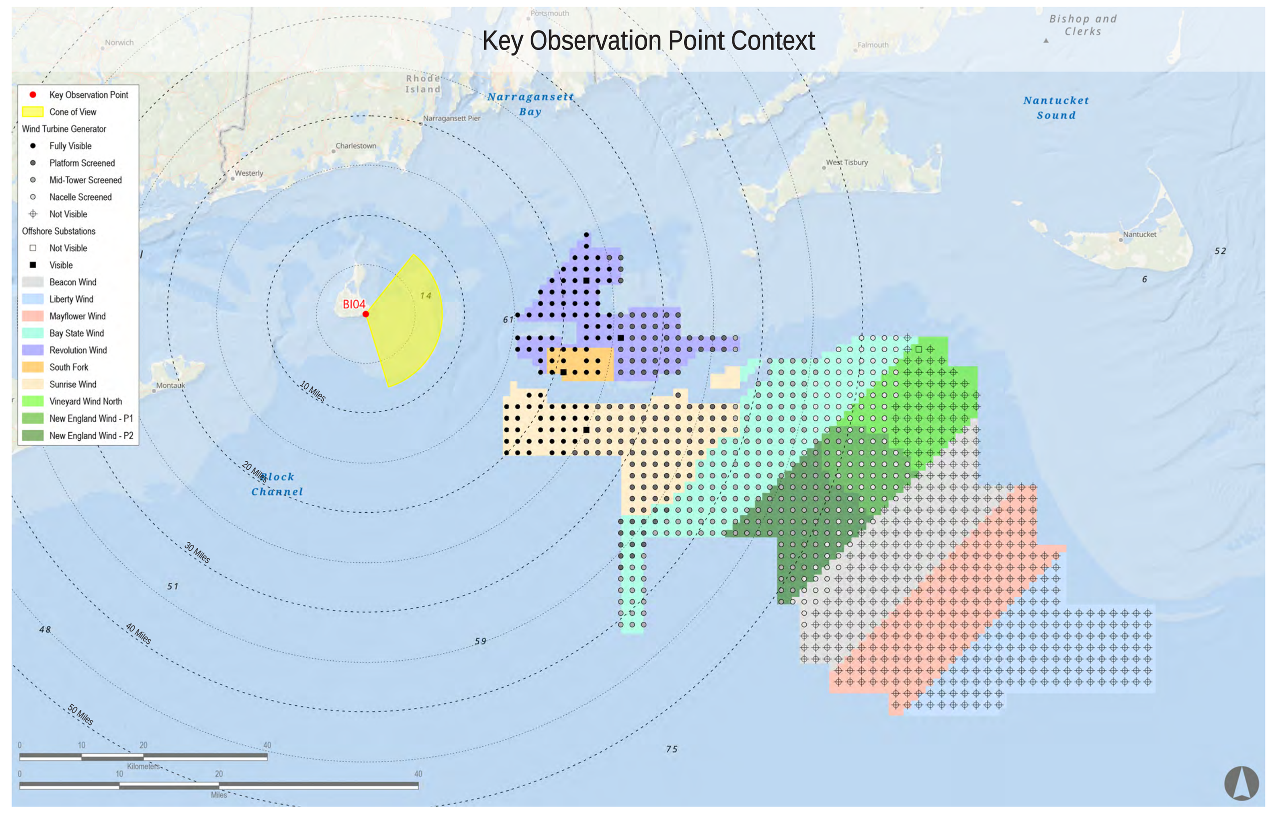
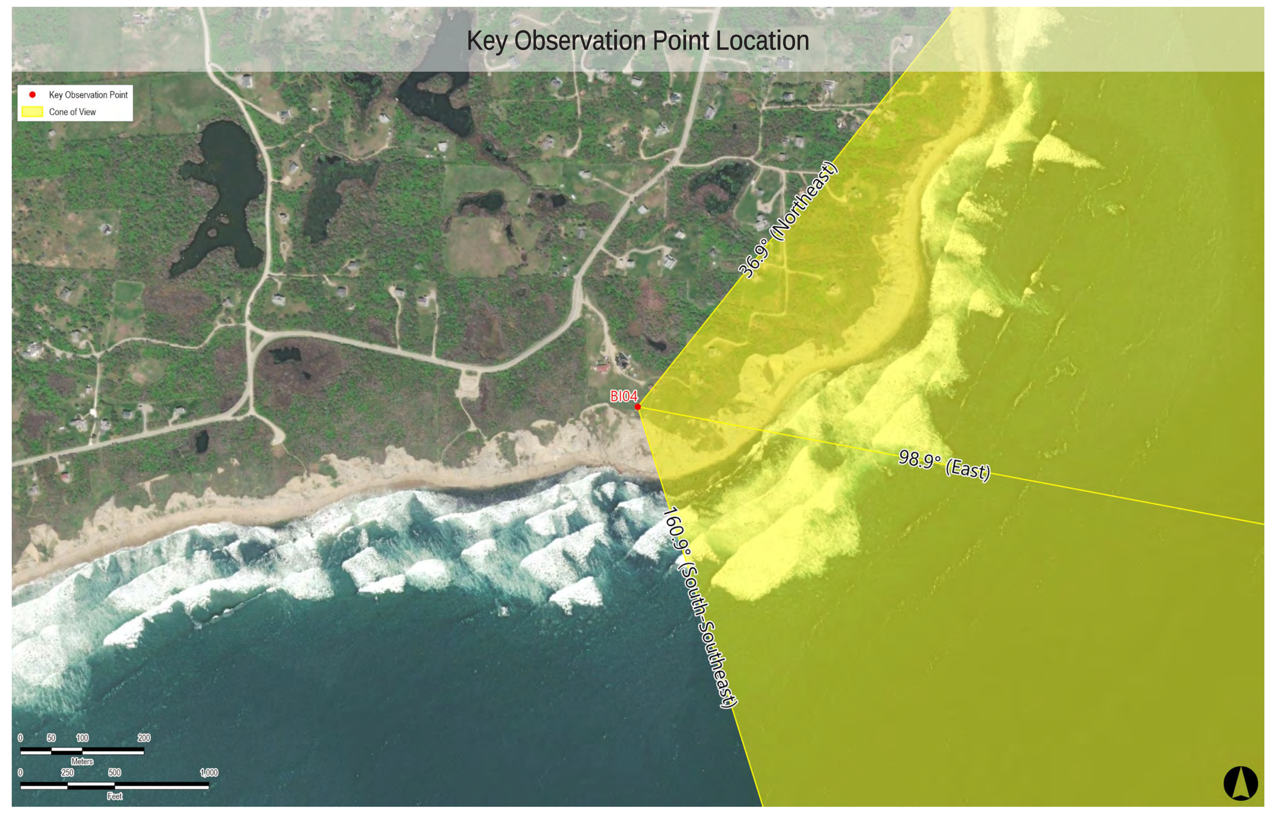
New England Wind Phase 2	2024	19 MW	79	79	43.1	54.9
Sunrise Wind	2024	15 MW	123	123	16.9	38.8
Mayflower Wind	2024	12 MW	0	149	NA	NA
Liberty Wind	2025-2030	12 MW	0	139	NA	NA
Beacon Wind	2025-2030	12 MW	13	157	51.6	53.9
Bay State Wind	2025-2030	12 MW	183	185	33.0	53.3





Revolution Wind

Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Full Lease Build-out Excluding Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Key Observation Point Information

County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources

Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:

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- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
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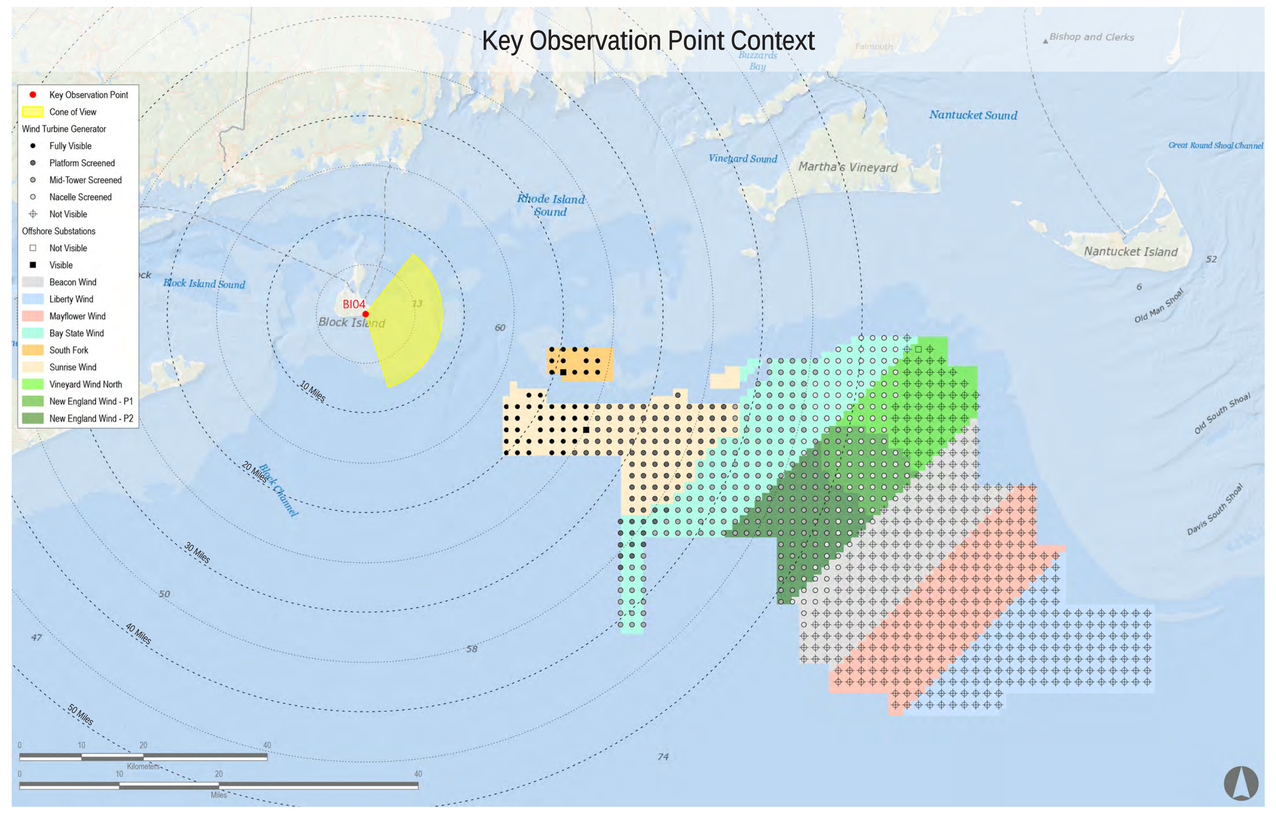
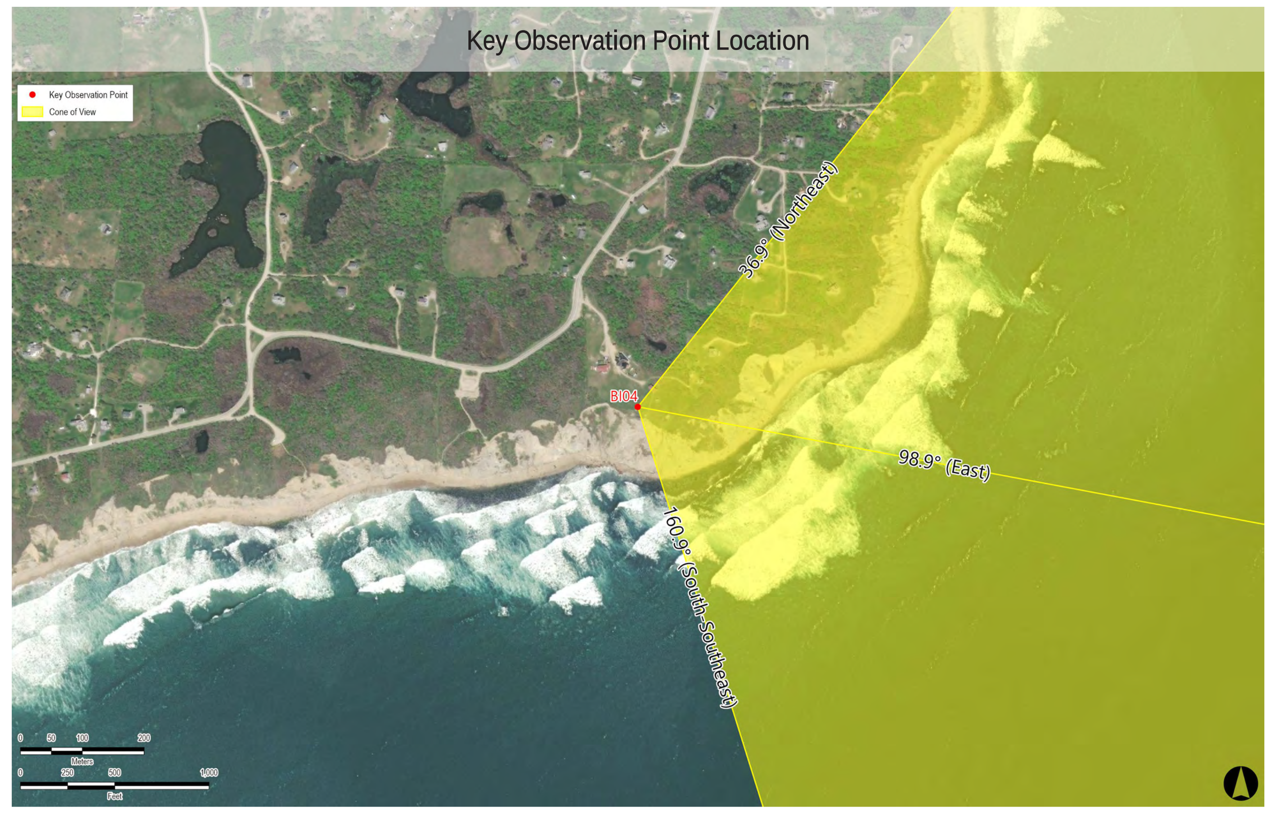
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	13	13	19.0	24.0
Vineyard Wind North	2023	14 MW	15	69	49.6	53.7
New England Wind Phase 1	2024	16 MW	41	41	48.0	56.6
New England Wind Phase 2	2024	19 MW	79	79	43.1	54.9
Sunrise Wind	2024	15 MW	123	123	16.9	38.8
Mayflower Wind	2024	12 MW	0	149	NA	NA
Liberty Wind	2025-2030	12 MW	0	139	NA	NA
Beacon Wind	2025-2030	12 MW	13	157	51.6	53.9
Bay State Wind	2025-2030	12 MW	183	185	33.0	53.3





Revolution Wind | Powered by Ørsted & Eversource

BI04: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Revolution Wind Without Other Foreseeable Future Changes

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 9/10/2017
Time: 12:20 PM
Temperature: 68°F
Humidity: 63%
Visibility: >10 miles
Wind Direction: Northeast
Wind Speed: 8 mph
Conditions Observed: Clear

Key Observation Point Information

County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources

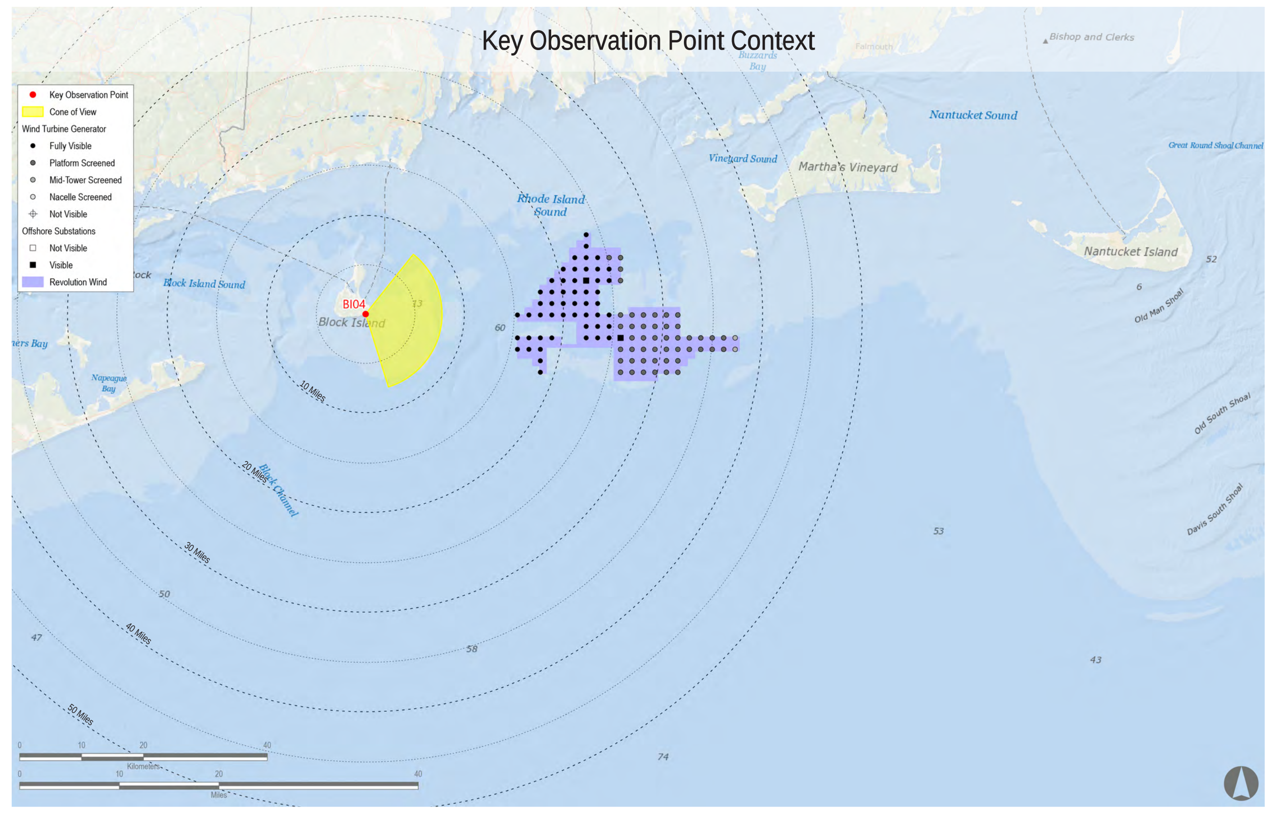
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

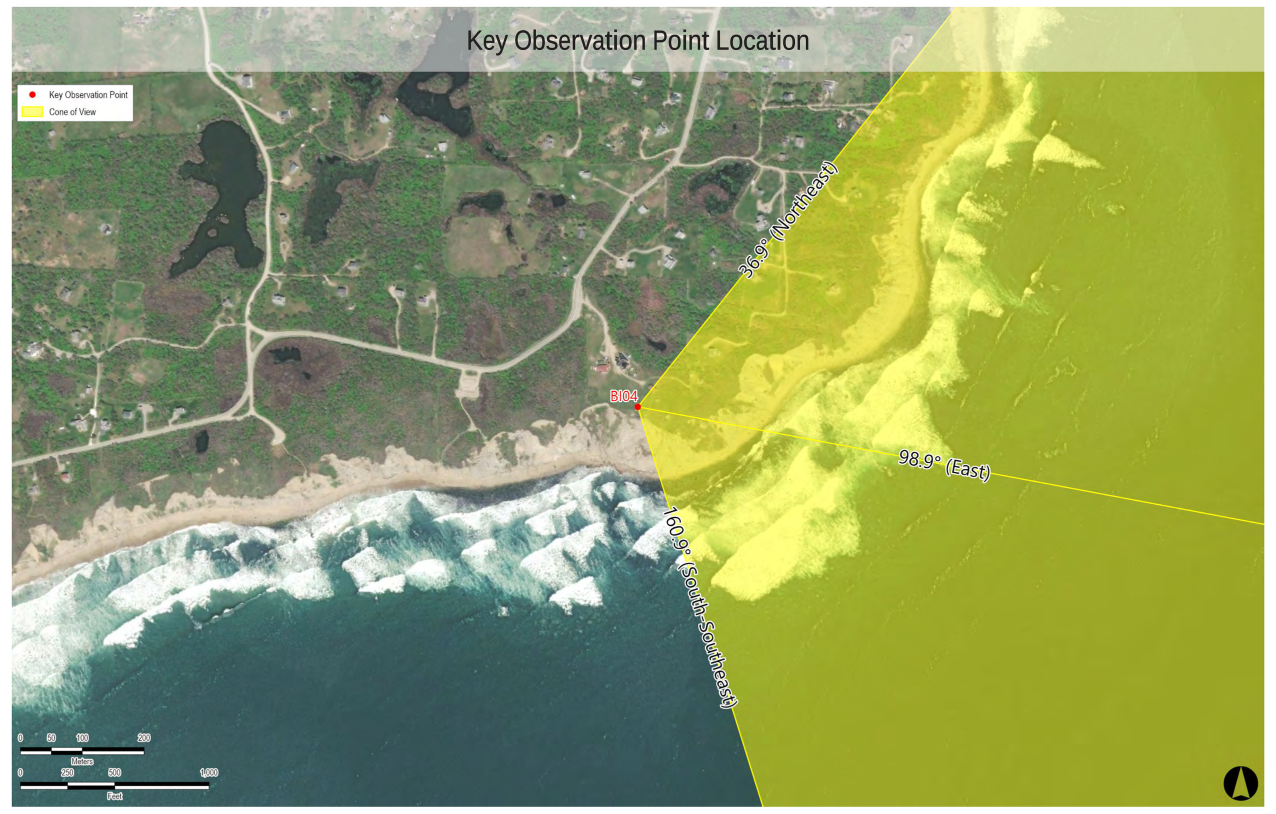
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
Revolution Wind	2023	12 MW	102	102	15.2	37.2





Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Existing Conditions

Simulation Size: 64" in width by 29.3" in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1" long on the printed panorama

Environmental Data

Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information

County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources

Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:

- Photosimulation Size: 64" in width by 29.3" in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
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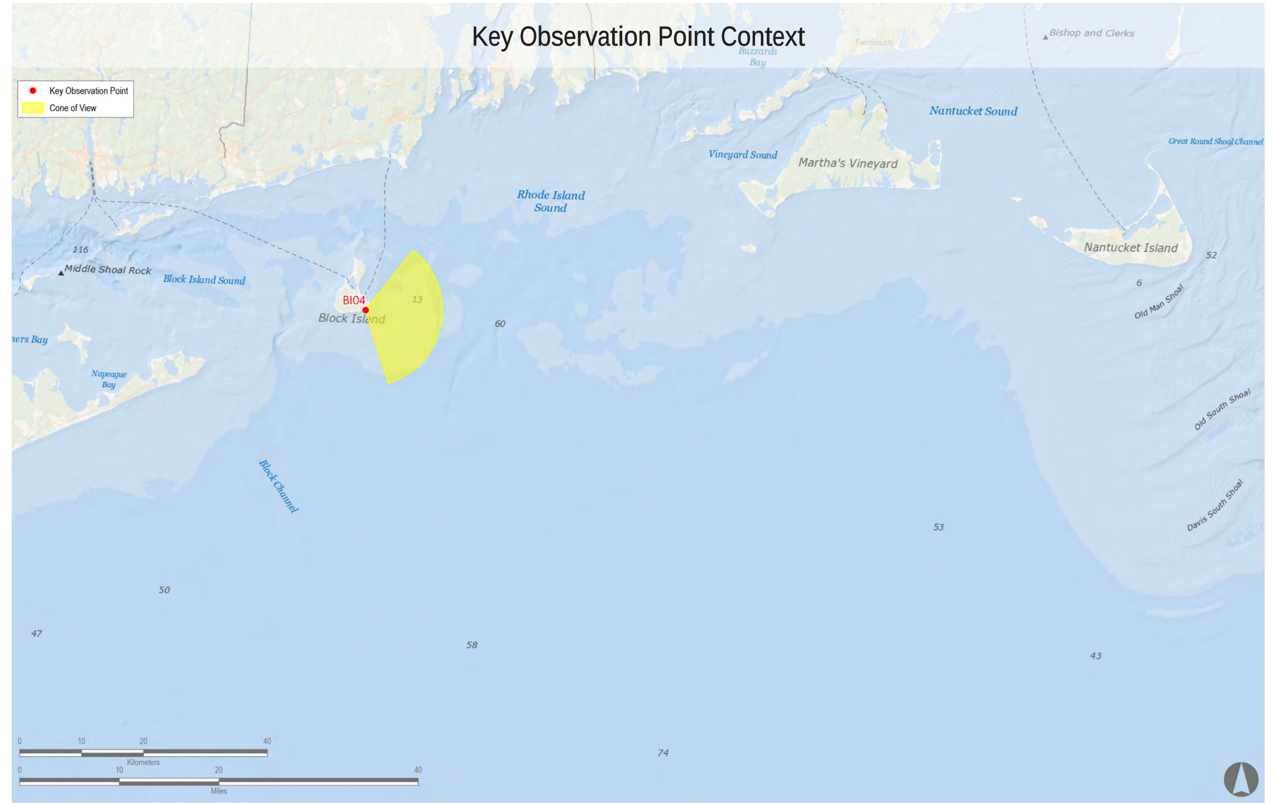
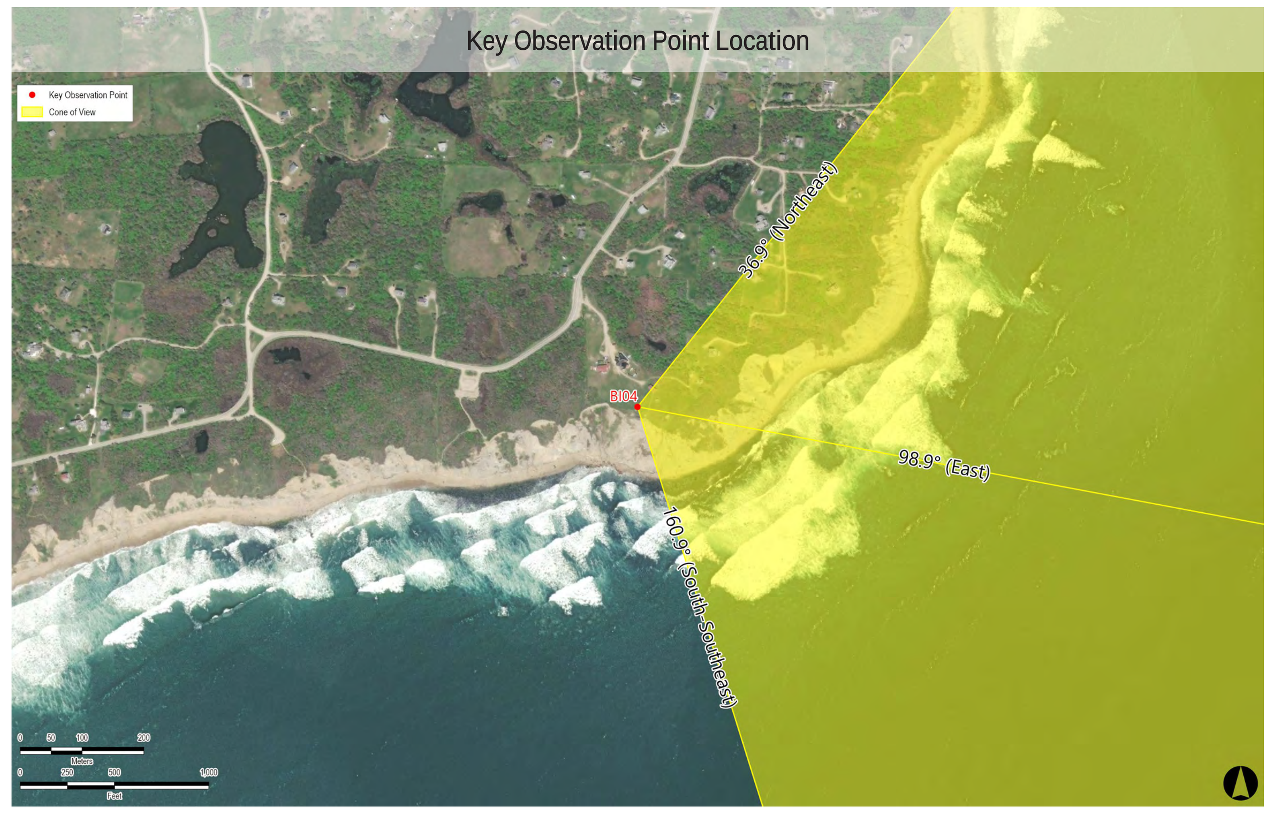
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.





Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: 2023 Project Construction (South Fork Wind and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

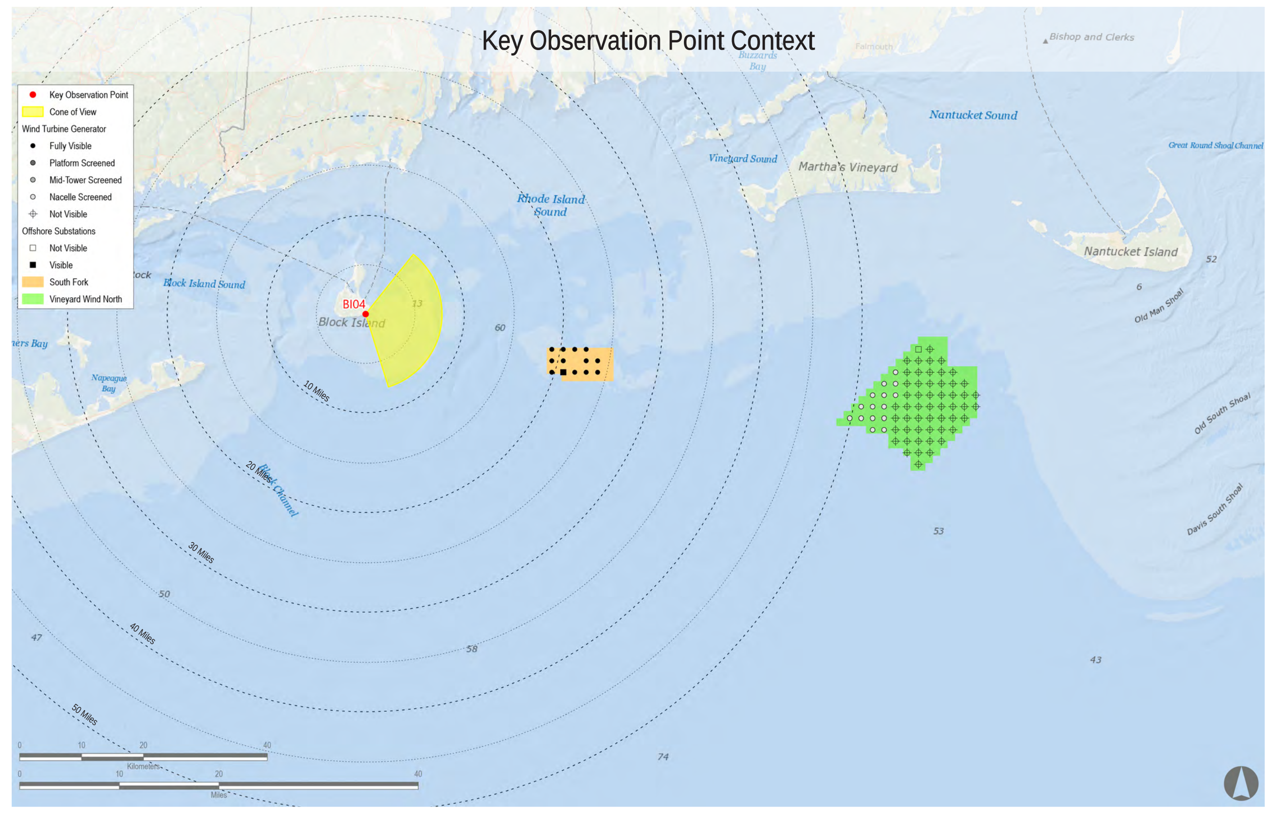
Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

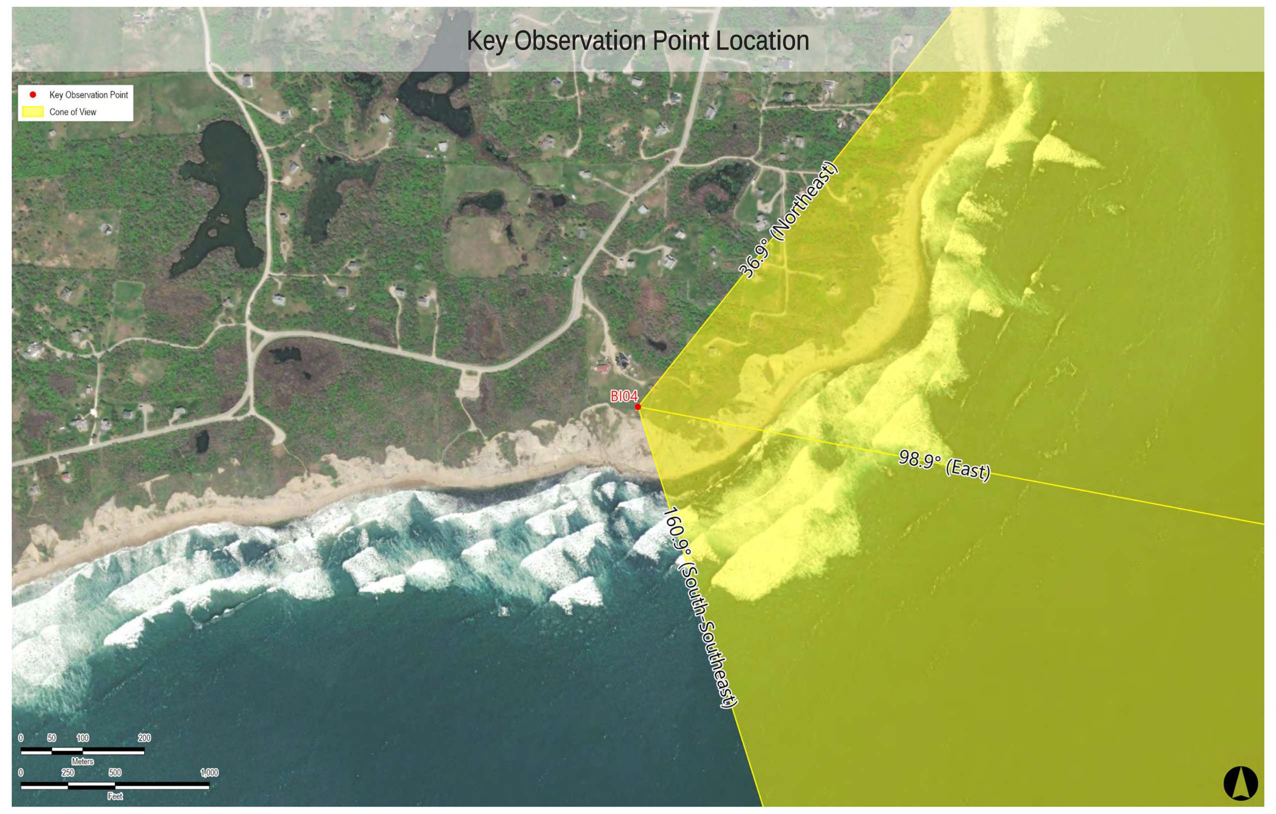
Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
- Offshore Substation location and dimensions are based on preliminary publicly available project data. Projects for which this data is not currently available, WTGs are used for all foundation positions. OSS positions and dimensions considered in this photosimulation are subject to potential modification.
- Nighttime photosimulations are digitally adjusted from daytime photographs. Nighttime photographs captured at each represented KOP inform the presence or lack of existing light sources.
- The existing WTGs associated with the Block Island Wind Farm are 16.9 miles from KOP LI04. In the daytime photosimulation, the WTGs appear faint due to atmospheric perspective commonly occurring on clear days such as the conditions illustrated in this photosimulation. In order to illustrate maximum potential visibility of the proposed WTG, this degree of atmospheric perspective is not applied to the photosimulations.
- Photographs were not obtained from NL01 during field review due to public access restrictions. In place of an actual photograph from this location, EDR created a virtual three-dimensional (3D) model of the island.

Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	13	13	19.0	24.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA





Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: 2023 Project Construction with Revolution Construction added (Revolution Wind, South Fork Wind, and Vineyard Wind North)

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
- The potential number of WTGs and OSSs screened from view was calculated using a curvature of the earth model based on the distance, viewer height, and maximum structure height. This analysis does not consider the screening effects of intervening vegetation, structures, and topography.
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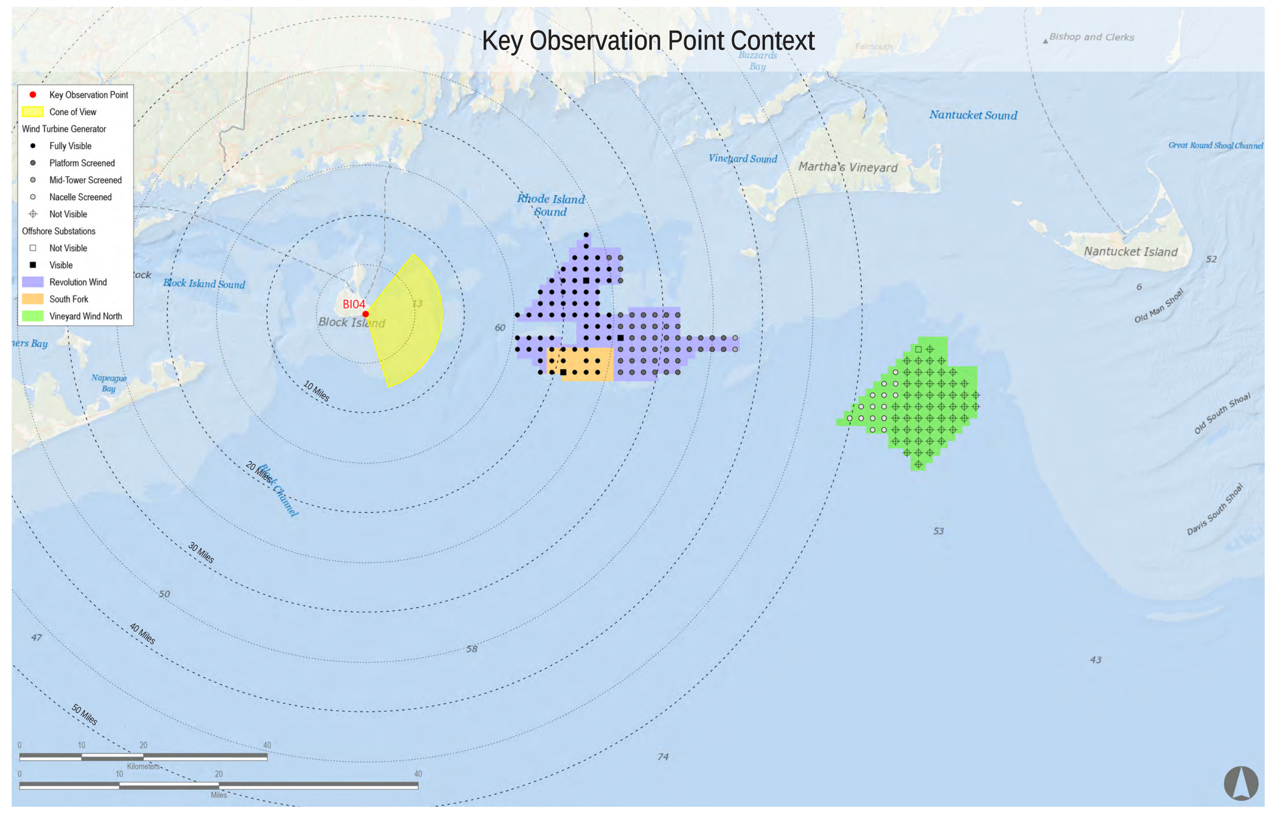
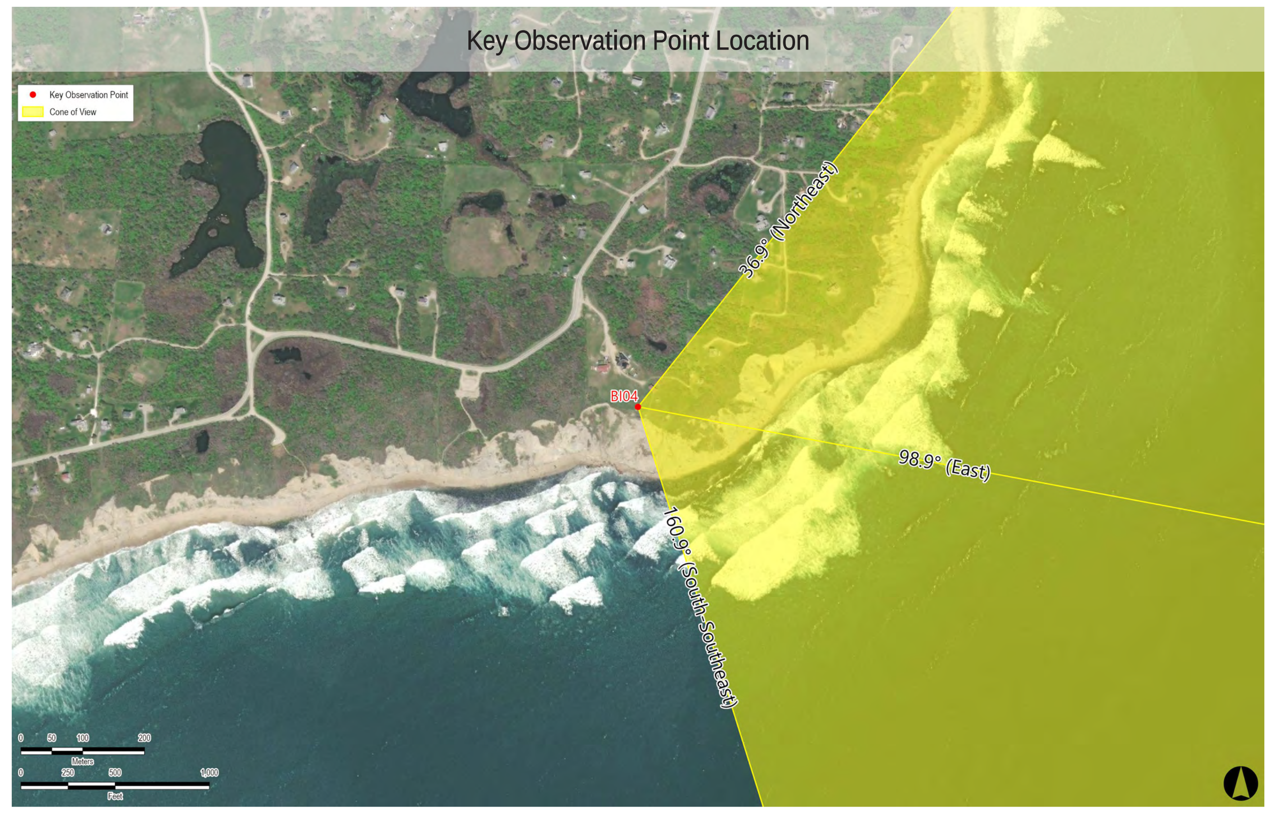
Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Nearest Visible WTG (miles)
South Fork Wind Farm	2023	12 MW	13	13	19.0	24.0
Vineyard Wind North	2023	14 MW	0	69	NA	NA
Revolution Wind	2023	12 MW	102	102	15.2	37.2





Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Full Lease Build-out Including Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

Notes:

- Photosimulation Size: 64” in width by 29.3” in height. Images should be viewed from 15 inches in order to obtain the proper perspective.
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Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
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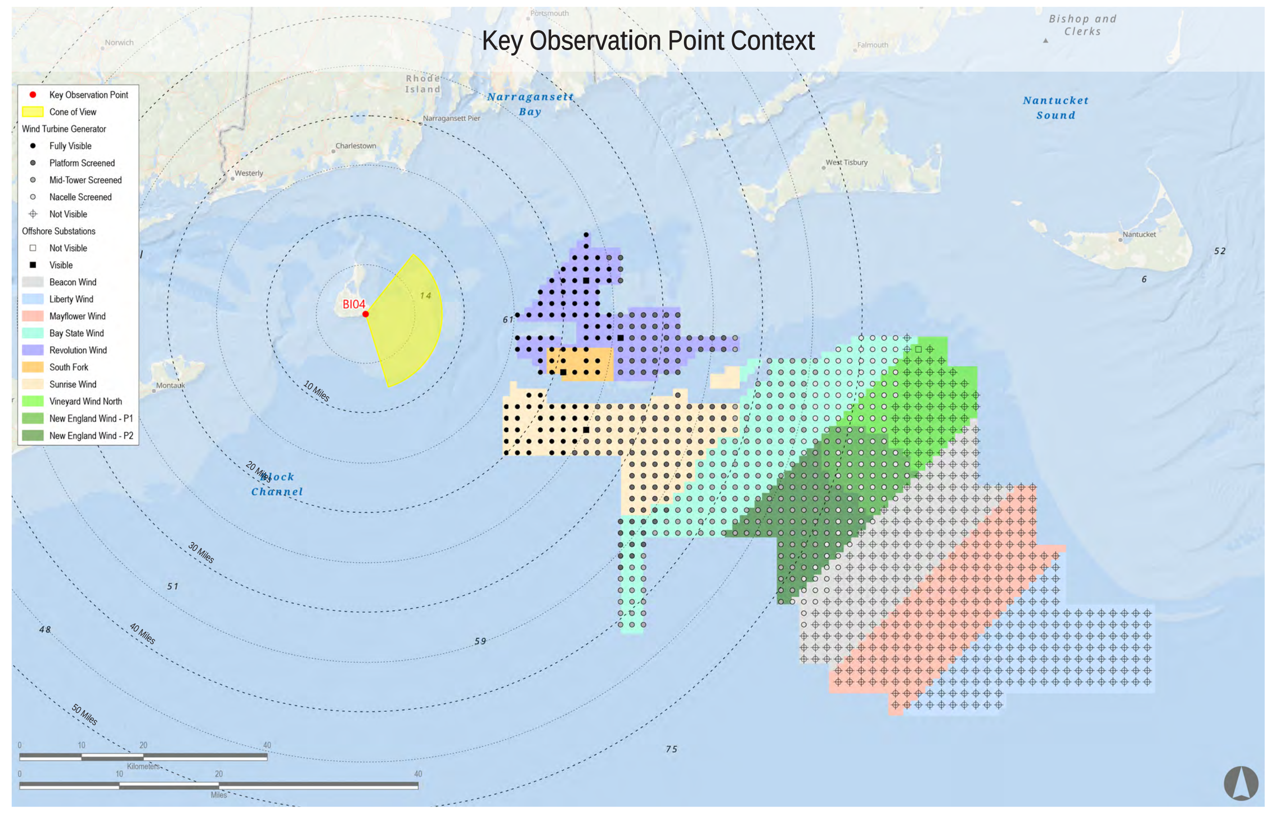
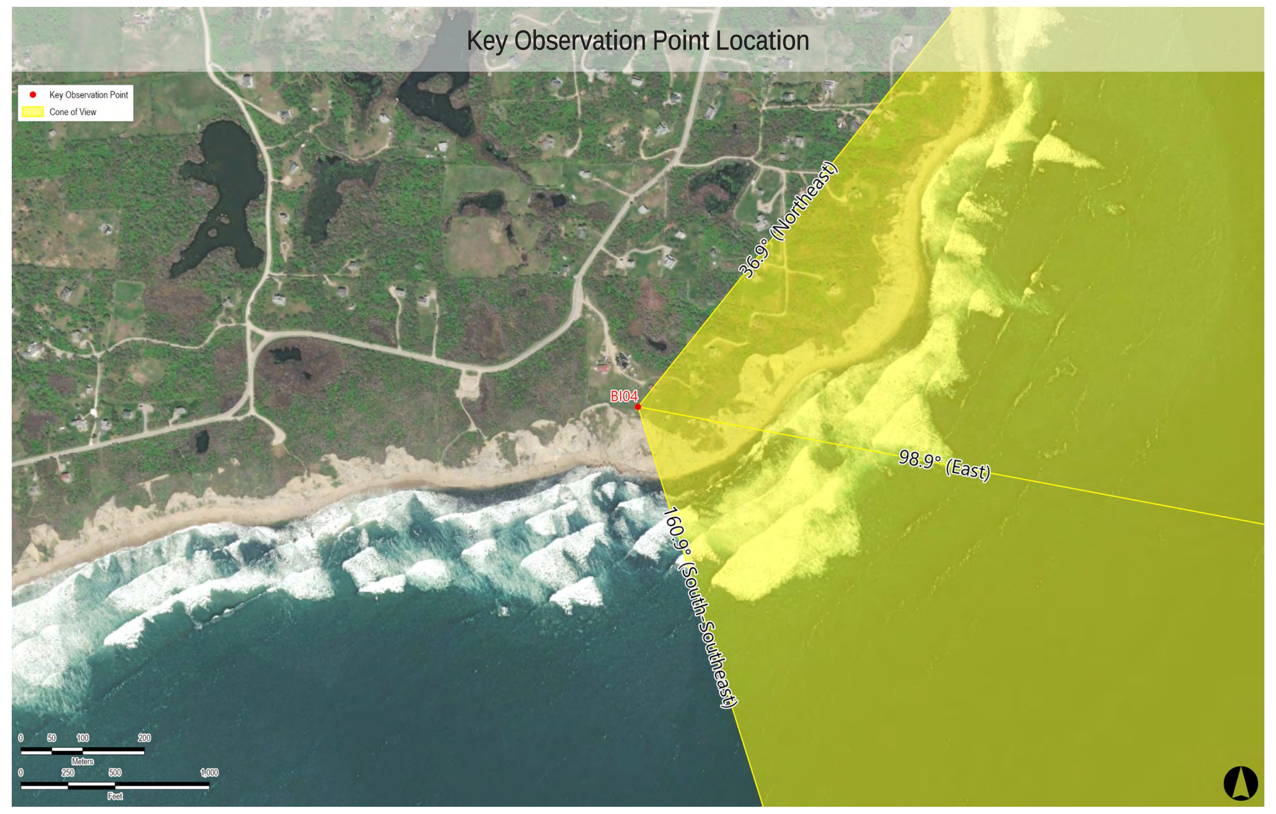
Vineyard Wind North	2023	14 MW	0	69	NA	NA
Revolution Wind	2023	12 MW	102	102	15.2	37.2
New England Wind Phase 1	2024	16 MW	4	41	48.0	48.8
New England Wind Phase 2	2024	19 MW	58	79	43.1	50.7
Sunrise Wind	2024	15 MW	123	123	16.9	38.2
Mayflower Wind	2024	12 MW	0	149	NA	NA
Liberty Wind	2025-2030	12 MW	0	139	NA	NA
Beacon Wind	2025-2030	12 MW	0	157	NA	NA
Bay State Wind	2025-2030	12 MW	134	185	33.0	45.0





Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Full Lease Build-out Excluding Revolution Wind

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data
Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information
County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
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Field of View: 124° x 55°

Camera Information
Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources
Landscape Similarity Zone: Maintained Recreation Area, Coastal Bluff
User Group: Local Resident, Tourist/Vacationers
Aesthetic Resource: Southeast Light National Historic Landmark, Mohegan Bluffs Scenic Area

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Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
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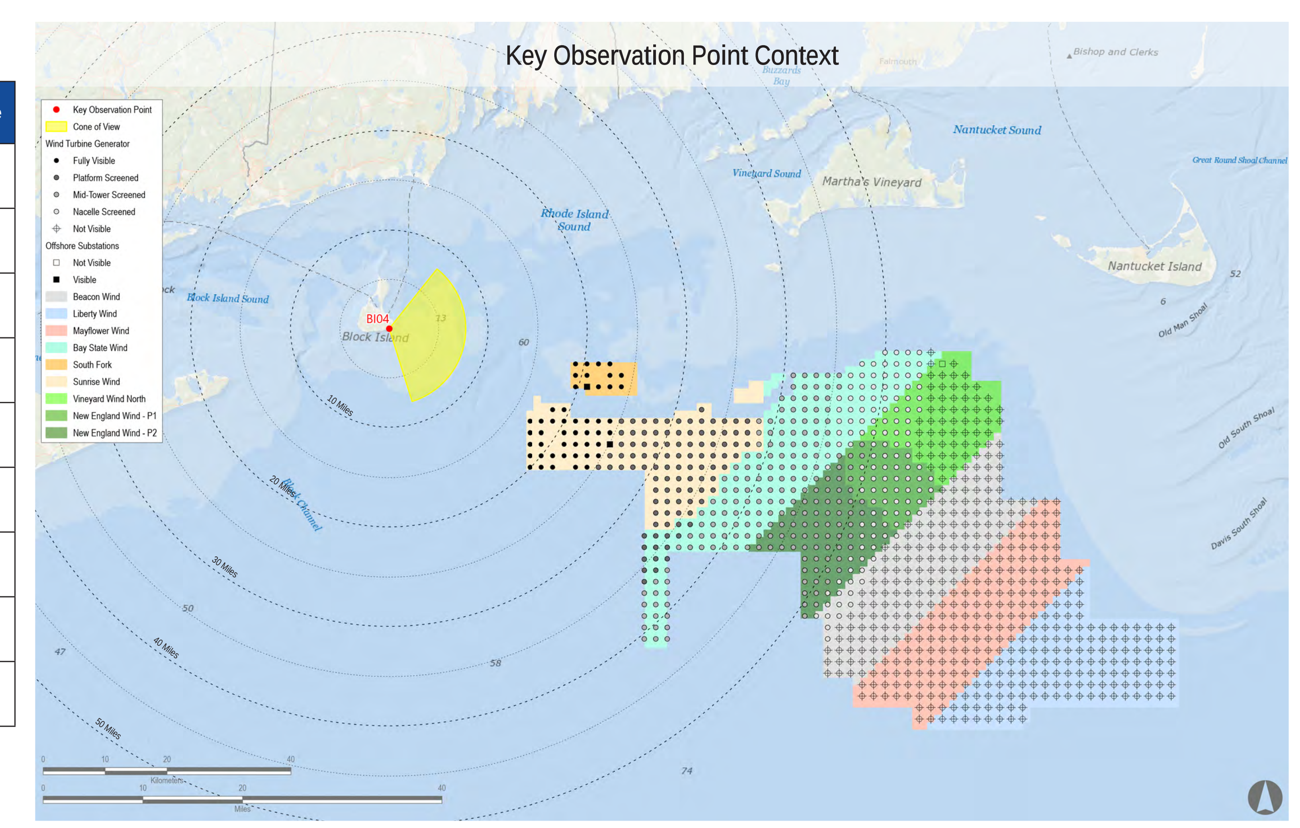
Bay State Wind	2025-2030	12 MW	134	185	33.0	45.0



Revolution Wind | Powered by Ørsted & Eversource

BI04 Night: Southeast Lighthouse, New Shoreham, Rhode Island

Visual Simulation: Revolution Wind Without Other Foreseeable Future Changes

Simulation Size: 64” in width by 29.3” in height. Images should be viewed from a distance of 15 inches in order to obtain the proper perspective.

This box should be exactly 1” long on the printed panorama

Environmental Data

Date Taken: 9/10/2017
Temperature: 61°F
Humidity: 93%
Visibility: >10 miles
Wind Direction: North-Northwest
Wind Speed: 6 mph
Conditions Observed: Fair

Key Observation Point Information

County: Washington
Town: New Shoreham
State: Rhode Island
Location: Block Island
Latitude, Longitude: 41.15281° N, 71.55185° W
Direction of View (Center): East (98.9°)
Field of View: 124° x 55°

Camera Information

Camera: Canon EOS 5D Mark IV
Resolution: 30.4 Megapixels
Lens Focal Length: 50 mm
Camera Height: 161.1 feet AMSL

Visual Resources

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User Group: Local Resident, Tourist/Vacationers
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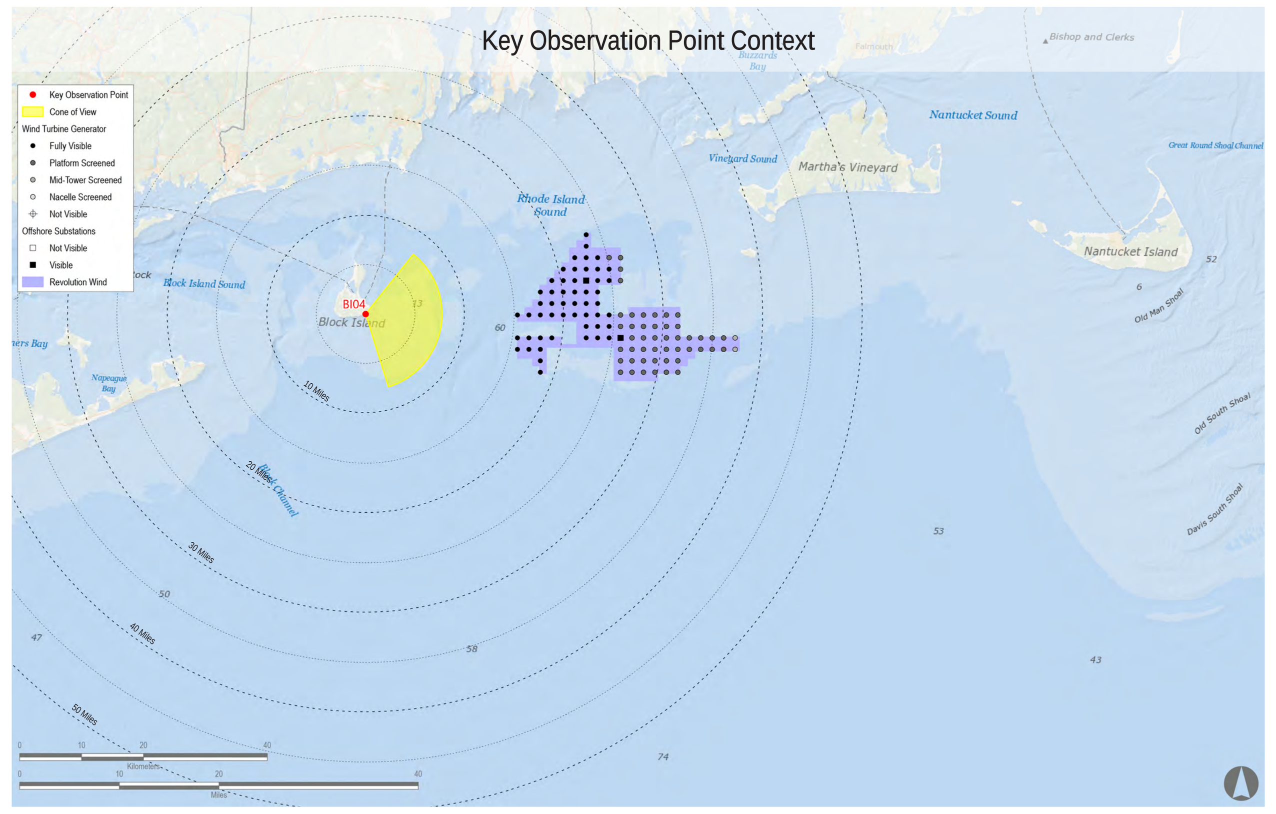
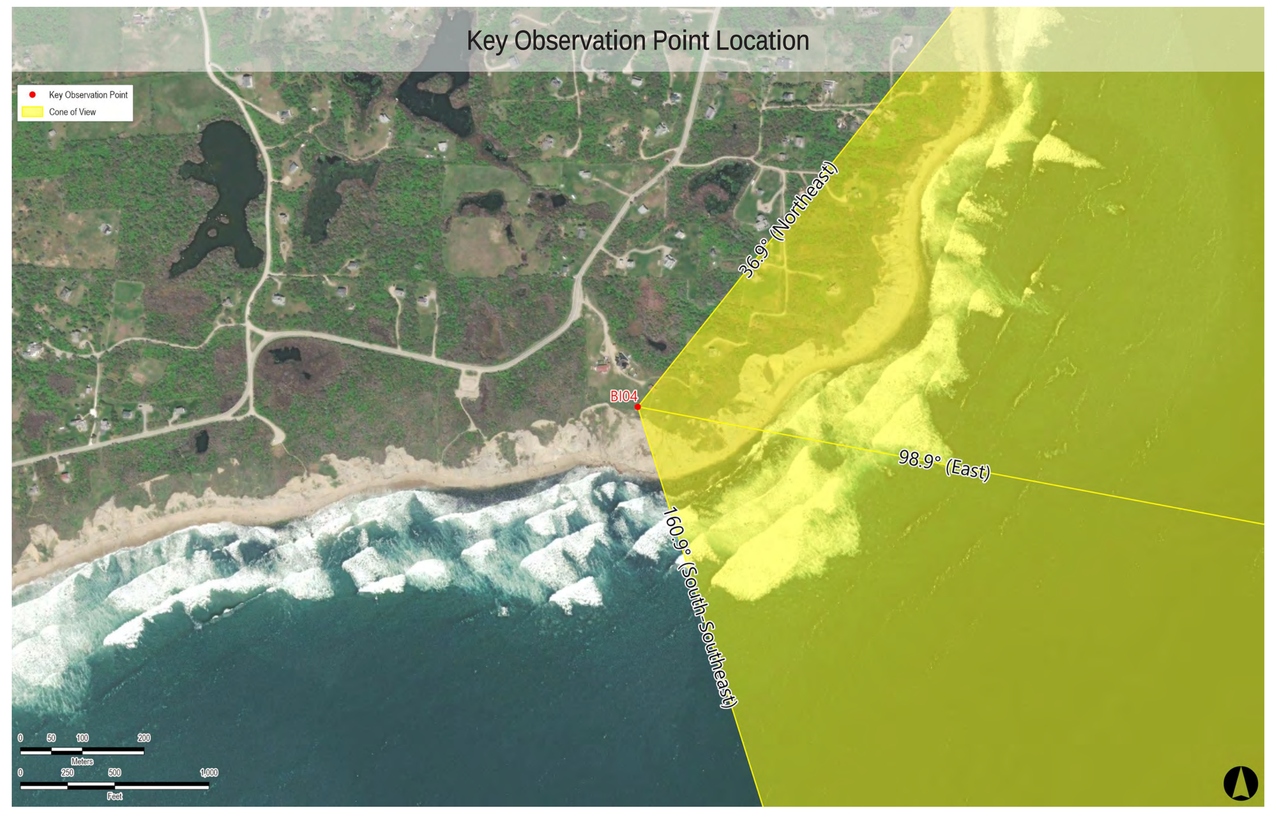
Reasonably Foreseeable Projects Represented in Visual Simulation

Project	Year of Development	WTG Model	Potential Number of WTGs & OSSs Visible*	Total Number of WTGs & OSSs in Project	Distance to Nearest Visible WTG (miles)	Distance to Furthest Visible WTG (miles)
Revolution Wind	2023	12 MW	102	102	15.2	37.2





DRAFT MEMORANDUM OF AGREEMENT AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT, THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT, MASSACHUSETTS, NEW YORK, AND RHODE ISLAND, AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION REGARDING THE REVOLUTION WIND FARM AND REVOLUTION WIND EXPORT CABLE PROJECT

WHEREAS, the Bureau of Ocean Energy Management (BOEM) plans to authorize construction and operation of the Revolution Wind Farm and Revolution Wind Export Cable Project (Project) 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 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 plans to approve with conditions the Construction and Operations Plan (COP) submitted by Revolution Wind, LLC (Revolution Wind); and

WHEREAS, BOEM determined the construction, operation, maintenance, and eventual decommissioning of the Project, designed for up to 100 offshore Wind Turbine Generators (WTGs), up to two offshore substations, up to two export cables collocated in one easement connecting from the OCS to landfall on Rhode Island shores, one onshore transmission cable connecting from landfall to one onshore substations and adjacent interconnection facility (ICF) with a buried connection line, and an overhead connection from the ICF to the existing TNEC Davisville Substation have the potential to 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 process with its Section 106 consultation pursuant to 36 CFR 800.8(c); and

WHEREAS, BOEM notified in advance the State Historic Preservation Officers (SHPOs) of Connecticut, Massachusetts, New York, and Rhode Island and the Advisory Council on Historic Preservation (ACHP) on April 6, 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 April 30, 2021; and

WHEREAS, BOEM notified and invited the Secretary of the Interior (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 National Historic Landmarks (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, in accordance with 36 CFR 800.3, BOEM invited Connecticut SHPO, Massachusetts SHPO, Rhode Island SHPO, and New York SHPO to consult on the Project on April 2, 2021, and Connecticut SHPO formally accepted on April 30, 2021, and Massachusetts SHPO, Rhode Island SHPO, and New York SHPO accepted through participation in consultation following that date; 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 October 12, 2017 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*) (Attachment 1).

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 viewshed portion of the APE (visual APE); and any temporary or permanent construction or staging areas that may fall into any of the aforementioned offshore or onshore portions of the APE (see Attachment 2 APE Maps); and

WHEREAS, BOEM identified 451 aboveground historic properties in the offshore Project components' portion of the visual APE and two historic properties in the onshore Project components' portion of the visual APE; nineteen submerged historic properties and ten ancient submerged landforms and features (ASLFs) in the marine APE; and two historic properties in the terrestrial APE; and

WHEREAS, BOEM identified twelve NHLs within the visual APE for onshore and offshore development; and

WHEREAS, within the range of Project alternatives analyzed in the EIS (EIS Chapter 2, Table 2.1-1), BOEM determined that 101 aboveground historic properties would be subject to visual adverse effects from WTGs (see Attachment 3), no submerged historic properties related to shipwrecks or sunken crafts will be adversely affected by physical disturbance from export cable construction within the avoidance buffers of these resources, nine ASLFs may be potentially adversely affected by physical disturbance in the lease area and from export cable construction, and two historic properties in the terrestrial APE would be 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 350 aboveground historic properties in the offshore visual APE (including seven NHLs), and to 19 submerged shipwrecks or sunken crafts and to one ASLF in the marine APE; and

WHEREAS, BOEM determined all of the ASLFs identified in the marine APE are eligible for the National Register of Historic Places (NRHP) under Criteria A and D; and

WHEREAS, under each of the Project alternatives analyzed in the EIS, BOEM determined the Project would visually adversely affect the 101 aboveground historic properties in Massachusetts and Rhode Island, including five NHLs; and

WHERAS, BOEM has identified historic sunken military craft (i.e., USS S-51) in the marine APE that are subject to the Sunken Military Craft Act (Public Law 108–375 Title XIV), administered by the

Department of the Navy for the protection of these craft and associated remains, BOEM has invited the Department of the Navy to consult on this undertaking and they accepted the invitation, and BOEM and the Department of the Navy will continue to coordinate consultation on the Sunken Military Craft Act through this Section 106 review to ensure compliance with that act; and

WHEREAS, the Connecticut SHPO, Massachusetts SHPO, New York SHPO, and Rhode Island SHPO concurred with BOEM's finding of adverse effect on [insert dates of SHPO's concurrence for the Massachusetts SHPO, Rhode Island SHPO, Connecticut SHPO, and New York SHPO]; and

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

WHEREAS, BOEM invited the following federally recognized Tribal Nations to consult on this Project: 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; and

WHEREAS, the Mashpee Wampanoag Tribe, Shinnecock Indian Nation, Mashantucket Pequot Tribal Nation, Wampanoag Tribe of Gay Head (Aquinnah), Narragansett Indian Tribe, Delaware Tribe of Indians, The Delaware Nation accepted BOEM's invitation to consult and BOEM invited these Tribal Nations to sign this MOA as concurring parties; 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 4; and

WHEREAS, BOEM has consulted with Revolution Wind in its capacity as applicant seeking federal approval of the COP, and, because Revolution Wind has responsibilities under the MOA, BOEM has invited the applicant to be an invited signatory to this MOA; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), BOEM has notified the ACHP of its adverse effect determination with specified documentation, and ACHP is consulting on the resolution of adverse effects to the historic properties pursuant to 36 CFR 800.6(a)(1)(iii); and

WHEREAS, pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, Department of the Army permits will be required from the United States Army Corps of Engineers (USACE) for this Project and 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 July 27, 2022), 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;

WHEREAS, BOEM has consulted with the signatories, invited signatories, and consulting parties participating in the development of this MOA regarding 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, pursuant to 36 CFR 800.6, BOEM invited Revolution Wind to sign as an invited signatory and the consulting parties as listed in Attachment 4 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 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 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 May 13, 18, and 20, 2021 and virtual public hearings related to the Draft EIS on [Month XX, 2022], [Month XX, 2022], and [Month XX, 2022], 2022; and

WHEREAS, BOEM made the first Draft MOA available to the public for review and comment from [Month XX, 2022], to [Month XX, 2022], and made an updated version of the Draft MOA available to the public from [Month XX, 2022], to [Month XX, 2022], using BOEM's Project website, and BOEM [did or did not receive any comments from the public]; and

NOW, THEREFORE, BOEM, the Connecticut SHPO, Massachusetts SHPO, New York SHPO, and Rhode Island SHPO, and the ACHP agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

BOEM, with the assistance of Revolution Wind, shall 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 Revolution Wind COP:

   i. Revolution Wind will avoid the 19 known shipwreck or sunken craft sites and potentially significant debris fields previously identified during marine archaeological surveys (Target-01 to Target-11 and Target-13 to Target-20) 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, to the extent practicable.

   ii. Revolution Wind will avoid ASLFs previously identified during marine archaeological resource assessments for the Project 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, to the extent practicable. Target-27 is avoidable and adverse effects to other ASLF could be avoidable through micrositing or through design options dependent on WTG placement and Project alternative selection.

II. MEASURES TO MINIMIZE ADVERSE EFFECTS TO IDENTIFIED HISTORIC PROPERTIES

A. Marine APE

1. Should full avoidance not be feasible for known ASLFs (Targets 21–26 and 28–30), Revolution Wind in consultation with BOEM will minimize the extent of project disturbance introduced on these sites. Disturbed portions of ASLFs will be addressed under mitigation

measures at MOA Stipulations III. Actions during minimization and mitigation at ASLFs would necessarily require the consultation with Tribal Nations.

B. Terrestrial APE
   1. Although the [redacted] #1 and [redacted] #2 sites were determined by BOEM to not be avoidable by project disturbance, Revolution Wind will minimize the extent of Project disturbance within these site areas to the extent practicable by protecting undisturbed site portions from Project impacts during construction, operations, maintenance, decommissioning and environmental restoration activities or mitigate those site portions prior to such activities. Protection measures may include fencing the resources or similar means to separate projects activities from the undisturbed site portions. Mitigation is described under Stipulation III, below.

C. Visual APE

   1. BOEM has undertaken planning and actions to minimize adverse effects to aboveground historic properties in the visual APE. BOEM will include these minimization measures for adverse effects within the visual APE as conditions of approval of the Revolution Wind COP:

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

      ii. Revolution Wind will use uniform spacing of 1 nautical mile (1.15 mile) to decrease visual clutter, aligning WTGs to allow for safe transit corridors.

      iii. The option to reduce the number of constructed WTGs from a maximum proposed number of 100.

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

      v. Revolution Wind will implement an aircraft detection lighting system (ADLS) to automatically activate lights when aircraft approach. The WTGs and OSS would be lit and marked in accordance with FAA and USCG 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. Marine APE

   1. Revolution Wind cannot avoid nine ASLFs (Targets 21 through 26, and Targets 29 and 30). To resolve the adverse effects to the nine ASLFs, BOEM will include the following as conditions of approval of the Revolution Wind COP and require fulfillment of the following as mitigation measures prior to construction. Revolution Wind will fund mitigation measures as described in Attachment 5 (Historic Property Treatment Plan for the Revolution Wind Farm Ancient Submerged Landforms, Outer Continental Shelf, Federal and Rhode Island Waters of Rhode Island Sound):

      i. Preconstruction Geoarchaeology. Revolution Wind will fulfill the following commitments: collaborative review of existing geophysical and geotechnical data with

Tribal Nations; selection of coring locations in consultation with Tribal Nations; collection of two to three vibracores within each affected ASLF with a sampling focus on areas that will be disturbed by Project construction activities; written verification to BOEM that the samples collected are sufficient for the planned analyses and consistent with the agreed scope of work; collaborative laboratory analyses at a laboratory located in Rhode Island or Massachusetts; screening of recovered sediments for debitage or micro-debitage associated with indigenous land uses; third-party laboratory analyses, including micro- and macro-faunal analyses, micro- and macro-botanical analyses, radiocarbon dating of organic subsamples, and chemical analyses for potential indirect evidence of indigenous occupations; temporary curation of archival core sections; draft reports for review by interested consulting ; final reporting; and public or professional presentations summarizing the results of the investigations, developed with the consent of the consulting Tribal Nations.

a. The Preconstruction Geoarchaeology effort will be conducted in accordance with BOEM's Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585. The qualified professional archaeologists leading the research will meet the SOI professional qualification standards for archeology (62 FR 33708) and BOEM's standards for Qualified Marine Archaeologists.

b. Revolution Wind will submit the Draft Tribal Audience Report, Draft Technical Report, Final Tribal Audience Report, Final Technical Report, and Draft Public or Professional Presentations to the interested consulting parties for review. Revolution Wind will provide draft descriptions and documentation of the GIS to the interested consulting parties for review and will provide a description of the draft Story Maps to the interested consulting Tribal Nations following the initial working sessions.

ii. Open-Source GIS and Story Maps. Revolution Wind will fulfill the following commitments: consultation with the Tribal Nations to determine the appropriate open-source GIS platform; review of candidate datasets and attributes for inclusion in the GIS; data integration; development of custom reports or queries to assist in future research or tribal maintenance of the GIS; work Sessions with Tribal Nations to develop Story Map content; training session with Tribal Nations to review GIS functionality; review of Draft Story Maps with Tribal Nations; delivery of GIS to Tribal Nations; and delivery of Final Story Maps.

a. The GIS developed under this measure will be free to use and free to modify by the tribes. To the extent feasible, all data will be provided in formats that allow for interoperability with other GIS platforms that the tribes may use. All datasets incorporated in the GIS will comply with Federal Geographic Data Committee data and metadata standards.

b. Revolution Wind will submit the Description of the GIS with appropriate schema, data organization, and custom reports/queries, Draft Story Map descriptions with details on content, formatting, and intended audiences, and Final Technical Description of the GIS with schema, data organization, and custom reports/queries to the interested consulting parties for review.

B. Terrestrial APE

1. Revolution Wind cannot avoid [redacted] #1 and [redacted] #2 sites by project disturbances. To resolve the adverse effects to the two archaeological sites, BOEM will include the following as conditions of approval of the Revolution Wind COP and require fulfillment of the following as mitigation measures prior to construction. Revolution Wind will fund mitigation measures as described in Attachment 6 (Historic Property Treatment Plan for the Revolution Wind Farm, the [redacted] #1 and #2 Sites, Town of North Kingstown, Washington County, Rhode Island):

    i. Data Recovery Investigations. Revolution Wind will fulfill the following commitments: The preparation of a Phase III Work Plan for submission and review by the Rhode Island State Historic Preservation Officer (RI SHPO), BOEM and Tribal Nations that specifies the scope of the proposed Phase III investigation; field investigation of approximately 20% of the affected sections of both historic properties, including a mix of Shovel Test Probes and 1x1-meter excavation units to document the stratigraphic integrity of the site, investigate artifact concentrations, and/or investigate potential features more precisely; feature documentation and excavation; and artifact recovery, processing, and analysis.

        a. Revolution Wind will develop the project consistent with the Rhode Island Historical Preservation & Heritage Commission's (RIHPC) Standards for Archaeological Survey (the *Standards)* and Rhode Island Historical Preservation & Heritage Commission's (RIHPHC) Performance Standards and Guidelines for Archaeology in Rhode Island (the *Guidelines)*.

        b. Revolution Wind will submit the Phase III Work Plan, Draft Phase III Archaeological Data Recovery Report, and Final Phase III Archaeological Data Recovery Report to the interested consulting parties for review. The reports will be prepared in accordance with the *Standards*.

C. Visual APE

1. BOEM will ensure the following mitigation measures to resolve the adverse effects to historic properties are required as conditions of approval of the Revolution Wind COP and are implemented by Revolution Wind, unless otherwise specified.

    i. [redacted] Traditional Cultural Property. BOEM will include the following as described in Attachment 7 (Historic Properties Treatment Plan for the Revolution Wind Farm: the [redacted] Traditional Cultural Property [redacted], Massachusetts & Atlantic Outer Continental Shelf) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

        a. GIS Database of Contributing Resources to the TCP

            1) Revolution Wind will fund the development of a GIS database incorporating the results of on-going documentation of the TCP and will include information on existing conditions at each contributing resource and/or significant element of the TCP district as described in Attachment 7.

            2) Revolution Wind will have the documentation developed by professions meeting the qualifications specialized in the Secretary of the Interior's (SOI)

Professional Qualifications Standards (36 CFR Part 61). The GIS will be developed by professionals with demonstrated experience in the creation and organization of spatial databases of cultural resources and the relevant and specific attributes necessary for recordation and management. The GIS development will be overseen by a qualified Geographic Information Systems Professional

3) Revolution Wind will submit the Request for Proposal (RFP), proposals by qualified consultants in response to the RFP, preliminary draft of the exhibit, and final exhibit to the interested consulting parties for review.

b. Development of Interpretative Materials

1) Revolution Wind will fund the development of GIS story maps or comparable presentations could include relevant archival data, oral histories, news stories, video footage, and public domain datasets [redacted] as described in Attachment 7.

2) Revolution Wind will have the documentation developed by a qualified Geographic Information Systems Professional

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, draft deliverables, and final deliverables to the interested consulting parties for review.

c. Climate Adaptation Planning Study

1) Revolution Wind will fund the development of a Climate Adaptation Plan that is focused on the specific resources and characteristics of the [redacted] and needs of the associated traditional community as described in Attachment 7.

2) Revolution Wind will have the documentation developed by qualified professionals with Global Association of Risk Professionals' Sustainability and Climate Risk certification and/or demonstrated experience in the preparation of climate change risk assessments for municipal, state, or federal governments.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, draft plan, and final plan to the interested consulting parties for review.

ii. [redacted] Traditional Cultural Property. BOEM will include the following as described in Attachment 8 ([redacted] Traditional Cultural Property [redacted], Massachusetts & Atlantic Outer Continental Shelf) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Support for [redacted]

1) Revolution Wind will fund the development of a non-proprietary spatial database of contributing resources and associated physical features to assist in prioritizing preservation efforts and ensure that accurate information is available to support local, state, and federal consideration of TCP impacts in future permitting processes as described in Attachment 8.

2) The GIS database will be developed by professionals with demonstrated experience in the creation and organization of spatial databases of cultural resources and the relevant and specific attributes necessary for recordation and management. The GIS development will be overseen by a qualified Geographic Information Systems Professional.

3) Revolution Wind will submit the RFP, consultant bids in response to the RFP, draft deliverables, and final deliverables to the interested consulting parties for review.

b. <u>Scholarships and Training for [redacted] Resource Stewardship</u>

1) Revolution Wind will fund scholarships and fees for professional training or certification programs in the fields of Astronomy, Archaeology/Anthropology, Marine Sciences, Aquaculture, Marine Fisheries, Marine Construction, Native American Studies, Ethnohistory, History, Biology, and related fields as described in Attachment 8.

2) Revolution Wind will have the documentation prepared by professionals with demonstrated experience in education and training program management and fiscal reporting.

3) Revolution 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 interested consulting parties for review.

c. <u>Coastal Resilience and Habitat Restoration</u>

1) Revolution Wind 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 [redacted] practices, and documentation and/or recover of threatened elements of cultural sites associated with the TCP as described in Attachment 8.

2) Revolution Wind will have the documentation prepared by professionals with demonstrated experience in archaeology, habitat restoration, coastal resilience planning program management 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 MHC regulations (950 CMR 70).

3) Revolution Wind will submit the RFP, consultant bids in response to the RFP, draft deliverables, and final deliverables to the interested consulting parties for review.

d. Archaeological and Cultural Sites Data Compilation

1) Revolution Wind will fund updated inventories of archaeological and cultural resource data pertaining to the TCP and the preparation of updated historic contexts for the interpretation of such resources as described in Attachment 8.

2) Revolution Wind will have the updated inventory prepared by professionals meeting the Secretary of the Interior's professional qualification standards in archeology and/or history (36 CFR 60) and in direct consultation with each participating Tribal Nation.

3) Revolution Wind will submit the RFP, consultant bids in response to the RFP, draft and final historic context(s) and MHC inventory forms; and open source GIS database to the interested consulting parties for review.

e. Maritime Cultural Landscapes & Interconnected Contexts

1) Revolution Wind will fund a publicly-available and inclusive synthesis of information and knowledge about the maritime cultural landscapes along the shores, coastal islands, and waters of southern New England and Long Island as described in Attachment 8.

2) Revolution Wind will have the documentation prepared by professionals meeting the Secretary of the Interior's professional qualification standards in cultural anthropology, archeology, and/or history (36 CFR 60) and in direct consultation with each of the consulting Tribe's Tribal Historic Preservation Office or other designated tribal representative.

3) Revolution Wind will submit the RFP, consultant bids in response to the RFP, draft and final reports, and open-source GIS database to the interested consulting parties for review.

iii. Town of Dartmouth, Bristol County, Massachusetts: *Salter's Point*. BOEM will include the following as described in Attachment 9 (Historic Properties Treatment Plan for the Revolution Wind Farm: Salter's Point, Town of Dartmouth, Bristol County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 9.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

b. Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

iv. Town of Fairhaven, Bristol County, Massachusetts: *744 Sconticut Neck Road.* BOEM will include the following as described in Attachment 10 (Historic Properties Treatment Plan for the Revolution Wind Farm: 744 Sconticut Neck Road, Town of Fairhaven, Bristol County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 10.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

b. Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

v. Town of New Bedford, Bristol County, Massachusetts: *The Fort Taber Historic District and the Fort Rodman Historic District*. BOEM will include the following as described in Attachment 11 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Fort Taber Historic District and the Fort Rodman Historic District, Town of New Bedford, Bristol County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Implementation of Rehabilitation Plans and/or Universal Access

1) Revolution Wind will fund the next phase of the 2013 Architectural/Structural Assessment & Feasibility Study for Universal Access, which includes a conditions assessment and recommendations for repairs and rehabilitation of these two historic properties as described in Attachment 11.

2) Revolution Wind will develop the project consistent with the Town of New Bedford Historical Commission; Town of New Bedford Planning and Zoning; and the SOI Standards for Treatment of Historic Properties (36 CFR 68).

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft plans and specifications, final plans and specifications, and as-built documentation and photography, as applicable, to the interested consulting parties for review.

vi. Town of Westport, Bristol County, Massachusetts: *The Gooseberry Neck Observation Towers, the Gooseneck Causeway, the Westport Harbor Historic District, the Westport Point Historic District, the Westport Point Local Historic District, Westport Point Revolutionary War Properties, Horseneck Point Lifesaving Station, and Clam Shack Restaurant*. BOEM will include the following as described in Attachment 12 (Historic Properties Treatment Plan for the Revolution Wind Farm: Seven Historic Properties, Town of Westport, Bristol County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Maritime Infrastructure Survey

1) Revolution Wind will provide funding to survey and document maritime heritage resources including historic wharves, docks, buildings, and other infrastructure associated with historic properties identified in the HPTP as described in Attachment 12.

2) Revolution Wind will develop the project consistent with the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); the SOI Standards and Guidelines – Professional Qualifications Standards for Archaeology, History, Architectural History and/or Architecture (62 FR 33708); Massachusetts Historical Commission guidance; the Town of Westport's Community Preservation Commission's guidance, as applicable; and the Town of Westport's Cultural Council's guidance, as applicable.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, preliminary draft deliverables, and final deliverables to the interested consulting parties for review.

b. Adaptive Use Guidance

1) Revolution Wind will use fund the development of appropriate guidance on the preservation and adaptive use of historic wharves, docks, and buildings within the Westport Harbor and Westport Point historic district using the information developed from the Historic Maritime Infrastructure Survey as described in Attachment 12.

2) Revolution Wind will develop the project consistent with Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character; the SOI Standards for Treatment of Historic Properties (36 CFR 68); the SOI Guidelines for Architectural and Engineering Documentation; the Town of Westport's Building Department guidance and regulations, as applicable; the Town of Westport's Community Preservation Commission's guidance, as applicable; and the Town of Westport's Cultural Council's guidance, as applicable.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, preliminary draft deliverables, and final deliverables to the interested consulting parties for review.

vii. Town of Aquinnah, Dukes County, Massachusetts: *71 Moshup Trail, Leonard Vanderhoop House, Edwin DeVries Vanderhoop Homestead, Tom Cooper House,* *Theodore Haskins House, 3 Windy Hill Drive, Gay Head – Aquinnah Town Center Historic District, Gay Head – Aquinnah Shops, Gay Head – Aquinnah Coast Guard Station Barracks*. BOEM will include the following as described in Attachment 13 (Historic Properties Treatment Plan for the Revolution Wind Farm, Nine Historic Properties, Town of Aquinnah, Dukes County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Funding for Historic Preservation and Climate Adaptation Planning

   1) Revolution Wind will fund and conduct a historic preservation and climate adaptation planning project to help preserve the character and setting of historic properties within the Town of Aquinnah while addressing anticipated threats to historic resources and their setting from climate change as described in Attachment 13.

   2) Revolution Wind will develop the project consistent with the SOI Standards for Treatment of Historic Properties (36 CFR 68); Martha's Vineyard Commission's planning and climate change guidance, as applicable; Town of Aquinnah Community Preservation Committee guidance, as applicable; Town of Aquinnah Planning Bard Review Committee guidance, as applicable; and Town of Aquinnah Energy and Climate Committee guidance, as applicable.

   3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photography and documentation (e.g., mapping), preliminary draft of the historic preservation and climate adaptation plan, including photographs and maps, and final plans to the interested consulting parties for review.

b. Funding for Energy Efficiency Improvements to the Town Hall.

   1) Revolution Wind will fund energy efficiency improvements to the Aquinnah Town Hall to help to increase the energy efficiency and to help ensure the long-term preservation of this historic property as described in Attachment 13.

   2) Revolution Wind will develop the project consistent with the Town of Aquinnah Building Code, as applicable; the Town of Aquinnah Energy and Climate Committee guidance, as applicable; the SOI Standards for Rehabilitation (36 CFR 67.7); and National Park Service's Improving Energy Efficiency in Historic Buildings Preservation Brief 3.

   3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft plans and specifications, final plans and specifications, and as-built documentation including photographs to the interested consulting parties for review.

c. Complete Identified Needs from the Americans with Disabilities Act (ADA) Compliance Plan.

   1) Revolution Wind will fund and complete the next phase of work identified in the proposed ADA Compliance Plan for the Aquinnah Circle and the Gay

Head – Aquinnah Shops Area to ensure all visitors are able to access and enjoy the Gay Head – Aquinnah Shops as described in Attachment 13.

2) Revolution Wind will develop the project consistent with Town of Aquinnah, MA Building Code, as applicable; Martha's Vineyard regulations; Commission's planning guidance, as applicable; ADA; the Massachusetts Office on Disability Guidelines as applicable; and the SOI Standards and Guidelines for Rehabilitation (36 CFR 68).

3) Revolution Wind will submit photographs and documentation of existing conditions, a RFP, proposals by qualified consultants in response to the RFP, preliminary draft of the construction plans including schedule, cost, and specifications, and final construction plan to the interested consulting parties for review.

viii. Town of Aquinnah, Dukes County, Massachusetts: *The Gay Head Lighthouse*. BOEM will include the following as described in Attachment 14 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Gay Head Lighthouse, Town of Aquinnah, Dukes County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Rehabilitation of the Gay Head Lighthouse

1) Revolution Wind will fund and conduct the next phase of rehabilitation at the Gay Head Lighthouse to ensure the long-term preservation of the lighthouse by completing physical repairs and/or rehabilitation of the historic building materials as described in Attachment 14.

2) Revolution Wind will develop the project consistent with the Town of Aquinnah, MA Building Code; Martha's Vineyard Commission planning guidance, as applicable; Preservation Restriction (MGL Chapter 184, Section 31-33); United States Coast Guard Aid to Navigation (ATON) Access Easement (U. S. Department of Homeland Security and U. S. Coast Guard, 2005); the Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations; the Town of New Shoreham Historic District Commission; United States Coast Guard Aid to Navigation (ATON) Access Easement (U. S. Department of Homeland Security and U. S. Coast Guard, 2005); Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character; Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings; National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation; Historic Lighthouse Preservation Handbook; IALA-AISM Lighthouse Conservation Manual; Preservation Restriction (RIGL Title 42, Section 42-45-9); the SOI Standards for Treatment of Historic Properties (36 CFR 68); the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable; the SOI Standards for Treatment of Historic Properties (36 CFR 68); and the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable.

3) Revolution Wind will submit proposed scopes of work including draft text, project plans, and design specifications; photographic and written documentation of existing conditions; draft specifications and construction drawings; final Specifications and construction drawings; and a Summary Report of the work completed to the interested consulting parties for review.

ix. Town of Chilmark, Dukes County, Massachusetts: *Capt. Samuel Hancock – Capt. West Mitchell House, Russell Hancock House, Ernest Flanders House, Barn, and Shop, Simon Mayhew House, and Flaghole*. BOEM will include the following as described in Attachment 15 (Historic Properties Treatment Plan for the Revolution Wind Farm: Capt. Samuel Hancock – Capt. West Mitchell House, Russell Hancock House, Ernest Flanders House, Barn, and Shop, Simon Mayhew House, and Flaghole, Town of Chilmark, Dukes County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Hazard Mitigation Plan for Historic Properties

1) Revolution Wind will fund and develop a hazard mitigation plan for the five historic properties identified in Attachment 15 to provide funding that will assist the Town of Chilmark to "protect and preserve irreplaceable cultural resources from the threats posed by flooding, storm damage, and fire as described in Attachment 15.

2) Revolution Wind will develop the project consistent with the Town of Chilmark Planning Commission guidance, as applicable; the Town of Chilmark Community Preservation Commission guidance, as applicable; the Town of Chilmark Historical Commission guidance, as applicable; Martha's Vineyard Commission planning guidance, as applicable; SOI Standards for Guidance on the Identification of Historic Properties (36 CFR 800.4), and SOI Professional Qualification Standards (36 CFR 61), as applicable.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, photography and documentation of existing conditions, draft updated historic property inventory if required, final updated historic property inventory if required, draft hazard mitigation plan, and final hazard mitigation plan to the interested consulting parties for review.

x. Town of West Tisbury, Dukes County, Massachusetts: *The Scrubby Neck Schoolhouse*. BOEM will include the following as described in Attachment 16 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Scrubby Neck Schoolhouse, Town of West Tisbury, Dukes County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Schoolhouse Conditions Assessment and Feasibility Plan

1) Revolution Wind will fund a conditions assessment and adaptive reuse plan to ensure the long-term use and preservation of the building as described in Attachment 16.

2) Revolution Wind will develop the project consistent with the Town of West Tisbury Building Department guidance and regulations, as applicable; Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character; the SOI Standards for Treatment of Historic Properties (36 CFR 68); and the National Park Service's Guidelines for Architectural and Engineering Documentation.

3) Revolution Wind will submit a RFP; proposals by qualified consultants in response to the RFP; photography and documentation (e.g., mapping); preliminary draft of the Conditions Assessment and Feasibility Plan; and final conditions assessment and feasibility plan to the interested consulting parties for review.

xi. City of Newport, Newport County, Rhode Island: *The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill, the Ochre Point – Cliffs Historic District, and the Ocean Drive Historic District NHL*. BOEM will include the following as described in Attachment 17 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill, the Ochre Point – Cliffs Historic District, and the Ocean Drive Historic District National Historic Landmark, City of Newport, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Property Owner Guidebook

1) Revolution Wind will provide funding to update the existing Standards and Guidelines for the Newport Local Historic District with a focus on climate change, resiliency planning, and energy efficiency. in historic buildings as described in Attachment 17.

2) Revolution Wind will develop the project consistent with the SOI Standards and Guidelines for Treatment of Historic Properties (36 CFR 68); the National Park Service's Creating and Using Design Guidelines; the 2017 City of Newport's Comprehensive Land Use Plan; the City of Newport, Rhode Island Natural Hazard Mitigation Plan; the City of Newport Building, Zoning, and Inspections; and the City of Newport Historic District Commission.

3) Revolution Wind will submit a RFP, consultant bids in response to a RFP, draft Historic Property Owner Guidebook, and Historic Property Owner Guidebook to the interested consulting parties for review.

b. Stormwater Drainage Improvement Plans for the Historic Districts

1) Revolution Wind will provide funding to develop plans to improve overall stormwater drainage for the historic districts and create areas of permeable surfaces to decrease the likelihood of flooding occurring in and around historic properties as described in Attachment 17.

2) Revolution Wind will develop the project consistent with the U.S. Environmental Protection Agency guidance and regulations, as applicable; the SOI Standards and Guidelines for Treatment of Historic Properties (36 CFR 68.3); the National Park Service's Creating and Using Design Guidelines; the

2017 City of Newport's Comprehensive Land Use Plan; the City of Newport, Rhode Island Natural Hazard Mitigation Plan; the City of Newport Department of Utilities guidance and regulations, as applicable; the City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable; the City of Newport Historic District Commission guidance and regulations, as applicable; and the City of Newport Historic Department of Planning & Economic Development guidance and regulations, as applicable; the City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photography and documentation of existing conditions; preliminary stormwater management plans; and final stormwater management plans to the interested consulting parties for review.

xii. City of Newport, Newport County, Rhode Island: *The Bellevue Avenue Historic District NHL, Rosecliff, The Breakers NHL, and Marble House NHL*. BOEM will include the following as described in Attachment 18 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Bellevue Avenue Historic District, Rosecliff, The Breakers, and Marble House, City of Newport, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. National Register of Historic Places Nomination for the Cliff Walk

1) Revolution Wind will provide funding to officially document the history and significance of the Cliff Walk as an individual historic property as described in Attachment 18. The Cliff Walk is a publicly accessible walkway that intersects the Bellevue Avenue Historic District and various other historic properties along the Newport shore, including at The Breakers, Rosecliff, and Marble House.

2) Revolution Wind will develop the project consistent with the City of Newport Historic District Commission standards; the City of Newport Historic District Zoning, Chapter 17.80; the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); the SOI Standards and Guidelines – Professional Qualifications Standards, for Archaeology, History, Architectural History and/or Architecture (62 FR 33708); National Park Service's National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation; National Register Bulletin 16a: How to Complete the National Register Registration Form (NPS, 1997b); and RIHPHC guidance.

3) Revolution Wind will submit the RFP, proposals by qualified consults in response to the RFP, preliminary draft of the NRHP nomination form, and revised draft of the NRHP nomination form to the interested consulting parties for review.

b. Development of a Resiliency Plan for the Cliff Walk

1) Revolution Wind will provide funding to support the City of Newport's existing initiative to prepare a Resiliency Plan (or similar) to develop

measures that can be taken to maintain the setting and character of the Cliff Walk and ensure its long-term preservation as described in Attachment 18.

2) Revolution Wind will develop the project consistent with the SOI Standards for Treatment of Historic Properties (36 CFR 68); the 2017 City of Newport's Comprehensive Land Use Plan; the City of Newport, Rhode Island Natural Hazard Mitigation Plan; the City of Newport Department of Utilities guidance and regulations, as applicable; the City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable; the City of Newport Historic District Commission guidance and regulations, as applicable; and the City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable.

3) Revolution Wind will submit the RFP, preliminary draft of the Resiliency Plan; and Final Revised Resiliency Plan to the interested consulting parties for review.

c. <u>Support On-Going Maintenance and Aesthetic Improvements to the Cliff Walk</u>

1) Revolution Wind will provide funding for the implementation of resiliency measures, on-going maintenance, and/or aesthetic improvements to the Cliff Walk to ensure the long-term preservation of this historic resource as described in Attachment 18.

2) Revolution Wind will develop the project consistent with the Newport Cliff Walk Commission; the City of Newport Building, Zoning, and Inspections; the City of Newport Historic District Commission; and the SOI Standards for Treatment of Historic Properties (36 CFR 68).

3) Revolution Wind will determine the appropriate supporting documentation in consultation with the interested consulting parties and allow them to review draft and final documents.

d. <u>Development of an Invasive Species Management Plan</u>

1) Revolution Wind will provide funding to provide an invasive species vegetation management plan for the historic properties of the City of Newport, with a focus on management of invasive species that threaten the historic character and ecology of the Cliff Walk as described in Attachment 18.

2) Revolution Wind will develop the project consistent with Preservation Brief #36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes (Birnbaum, 1994); the Alliance for Historic Landscape Preservation guidance, as applicable; the City of Newport Historic District Commission guidance and regulations, as applicable; the City of Newport Department of Planning & Economic Development guidance and regulations, as applicable; and the SOI Standards for Treatment of Historic Properties (36 CFR 68).

3) Revolution Wind will submit the RFP, proposals by qualified consults in response to the RFP; draft vegetation management plan; and final vegetation management plan to the interested consulting parties for review.

e. Volunteer Ambassador Program

1) Revolution Wind will provide funding to assist the Newport Cliff Walk Commission with the development of the Volunteer Ambassador Program as described in Attachment 18.

2) Revolution Wind will develop the project consistent with Preservation Brief #36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes, as applicable (Birnbaum, 1994); the Alliance for Historic Landscape Preservation guidance, as applicable; the City of Newport Historic District Commission guidance and regulations, as applicable; the City of Newport Department of Planning & Economic Development guidance and regulations, as applicable; and the SOI Standards for Treatment of Historic Properties (36 CFR 68).

3) Revolution Wind will submit the RFP, identified program needs, and program support plan to the interested consulting parties for review.

f. Mobile Application

1) Revolution Wind will provide funding to undertake upgrades or additional content for the existing "Cliff Walk" mobile application developed by the City of Newport in 2015, or to create a new mobile app for the Cliff Walk as described in Attachment 18.

2) Revolution Wind will develop the project consistent with applicable standards for mobile application development.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, preliminary design of the application, and final application design to the interested consulting parties for review.

xiii. Town of Jamestown, Newport County, Rhode Island: *Horsehead/Marabella*. BOEM will include the following as described in Attachment 19 (Historic Properties Treatment Plan for the Revolution Wind Farm: Horsehead/Marabella, Town of Jamestown, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic American Building Survey (HABS) Documentation

1) Revolution Wind will provide funding to document historic architecture through measured drawings, photography, and historical narratives as described in Attachment 19.

2) Revolution Wind will develop the project consistent with HABS Guidelines, the Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4), and the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft documentation, and final HABS documentation for RI SHPO review.

xiv. Town of Little Compton, Newport County, Rhode Island: *The Abbott Phillips House, the Stone House Inn, the Warren's Point Historic District, and Tunipus Goosewing Farm*. BOEM will include the following as described in Attachment 20 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Abbott Phillips House, the Stone House Inn, and the Warren's Point Historic District, and Tunipus Goosewing Farm, Town of Little Compton, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Climate Adaptation and Sustainability Plan for Historic Properties

1) Revolution Wind will provide funding to develop a climate adaptation and sustainability plan for the Abbott Phillips House, the Stone House Inn, the Warren's Point Historic District, and Tunipus Goosewing Farm to assist with the long-term preservation of the historic properties in the Town of Little Compton while addressing anticipated threats to historic resources and their setting from climate change as described in Attachment 20.

2) Revolution Wind will develop the project consistent with the SOI Standards for Treatment of Historic Properties (36 CFR 68); the 2018 Town of Little Compton, Rhode Island Local Hazard Mitigation Plan; the 2018 Town of Little Compton Rhode Island Comprehensive Plan; Town of Little Compton Planning Board guidance and regulations, as applicable; and Town of Little Compton Conservation Commission guidance and regulations, as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft hazard mitigation plan, and final hazard mitigation plan to the interested consulting parties for review.

b. Development of an Interpretive Exhibit/Signage at Goosewing Beach

1) Revolution Wind will use the information developed in the Climate Adaptation and Sustainability Plan to provide public education materials as described in Attachment 20.

2) Revolution Wind will develop the project consistent with the Town of Little Compton Zoning Official guidance, as applicable; the National Park Service's Wayside Exhibits: A Guide to Developing Outdoor Interpretive Exhibits, as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft hazard mitigation plan, and final hazard mitigation plan to the interested consulting parties for review.

c. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 20.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

xv. Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review. <u>Town of Middletown, Newport County, Rhode Island</u>: *The Bailey Farm, the Clambake Club of Newport, Paradise Rocks Historic District, Sea View Villa, St. Georges School, the Indian Avenue Historic District, Whetstone, the Land Trust Cottages, and the Bluff/John Bancroft Estate*. BOEM will include the following as described in Attachment 21 (Historic Properties Treatment Plan for the Revolution Wind Farm: Nine Historic Properties, Town of Middletown, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. <u>Development of a Coastal/Shoreline Resiliency and Climate Adaptation Plan for Historic Properties</u>

1) Revolution Wind will provide funding to develop a coastal/shoreline resiliency and climate adaptation plan for the eight historic properties identified in Attachment 21 to provide the Town and historic property owners with specific measures that can be taken to protect their historic properties from flooding, coastal erosion, and other climate related threats as described in Attachment 21.

2) Revolution Wind will develop the project consistent with Town of Middletown Planning Regulations; Current Climate Adaptation, Resiliency, and related guidance; the SOI Standards for Treatment of Historic Properties (36 CFR 68); the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); and the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft updated historic property inventory if required, final updated historic property inventory if required, draft Coastal/Shoreline Resiliency and Climate Adaptation Plan, and final Coastal/Shoreline Resiliency and Climate Adaptation Plan to the interested consulting parties for review.

b. <u>Historic Context for Summer Cottage/Resort Development</u>

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 21.

2) Revolution Wind will develop the project consistent with the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

xvi. Town of Tiverton, Newport County, Rhode Island: *Puncatest Neck Historic District.* BOEM will include the following as described in Attachment 22 (Historic Properties Treatment Plan for the Revolution Wind Farm: Nine Historic Properties, Town of Tiverton, Newport County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 22.

2) Revolution Wind will develop the project consistent with the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

xvii. Town of Narragansett, Washington County, Rhode Island: *Dunmere, the Ocean Road Historic District, the Towers Historic District, the Towers (and Narragansett Casino Entrance), the Life Saving Station at Narragansett Pier, Fort Varnum/Camp Varnum, Narragansett Pier MRA, the Dunes Club.* BOEM will include the following as described in Attachment 23 (Historic Properties Treatment Plan for the Revolution Wind Farm: Eight Historic Properties, Town of Narragansett, Washington County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Ocean Road Seawall Assessment

1) Revolution Wind will provide funding to complete a study to determine an implementation plan to preserve the Ocean Road Seawall as described in Attachment 23. The intended outcome is to provide funding to assess the Ocean Road seawall and prioritize repairs and improvements that would enhance protection of the Ocean Road Historic District and preserve the character of existing historic shoreline settings.

2) Revolution Wind will develop the project consistent with the Town of Narragansett Code of Ordinances Chapter No. 1081 Buildings and Building Regulations.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft plan and final plan to the interested consulting parties for review.

b. National Register of Historic Places Nomination for Fort Varnum/Camp Varnum

1) Revolution Wind will provide funding to officially document the history and significance of Fort Varnum/Camp Varnum and the role the property played in the defense of the eastern seaboard during World War II, as well as the role it continues to play in defense of the United States as described in Attachment 23.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4), the Secretary of the Interior's Standards and Guidelines – Professional Qualifications Standards, for Archaeology, History, Architectural History and/or Architecture (62 FR 33708), National Park Service's National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation, National Register Bulletin 16a: How to Complete the National Register Registration Form, and RIHPHC guidance.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, Preliminary Draft of the NRHP Nomination Form, and Revised draft of the NRHP Nomination Form to the interested consulting parties for review.

c. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 23.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

xviii. Town of New Shoreham, Washington County, Rhode Island: *The Block Island Southeast Lighthouse NHL*. BOEM will include the following as described in Attachment 24 (Historic Properties Treatment Plan for the Revolution Wind Farm: the Block Island Southeast Lighthouse, National Historic Landmark, Town of New Shoreham, Washington County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Cyclical Maintenance Activities and Restoration

1) Revolution Wind will provide funding for the implementation of cyclical maintenance and restoration activities as identified in the cyclical maintenance plan at the Block Island Southeast Lighthouse NHL as described in Attachment 24.

2) Revolution Wind will develop the project consistent with the SOI Standards for Treatment of Historic Properties (36 CFR 68); the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); the Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations, as applicable; and the Town of New Shoreham Historic District Commission guidance and regulations, as applicable; the Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations; the Town of New Shoreham Historic District Commission; United States Coast Guard Aid to Navigation (ATON) Access Easement; Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character; Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings; National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation; Historic Lighthouse Preservation Handbook; IALA-AISM Lighthouse Conservation Manual; Preservation Restriction (RIGL Title 42, Section 42-45-9); the SOI Standards for Treatment of Historic Properties (36 CFR 68); and the SOI Professional Qualifications Standards (36 CFR Part 61), as applicable.

3) Revolution Wind will submit the RFP, proposals by qualified consultants in response to the RFP, existing condition documentation including photographs, draft plans and specifications, if applicable; final plans and specifications, if applicable; as-built documentation, including photographs; and other documentation, as required, to the interested consulting parties for review.

xix. Town of New Shoreham, Washington County, Rhode Island*: The Old Harbor Historic District, New Shoreham Historic District, the Corn Neck Road Historic District, the Indian Head Neck Road Historic District, the Hippocampus/Boy's camp/Beane Family, the Mitchell Farm, the U.S. Lifesaving Station, the U.S. Coast Guard Brick House, the U.S. Weather Bureau Station, the Hygeia House, the Peleg Champlin House, the Beach Avenue Historic District, the Lakeside Drive and Mitchell Lane Historic District, the Nathan Mott Park, the Champlin Farm Historic District, Island Cemetery/Old Burial Ground, the Old Town and Center Roads Historic District, the Beacon Hill Road Historic District, the Mohegan Cottage, the Lewis Farm and Dickens Farm 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 Captain Mark L. Potter House, , the Captain Welcome Dodge Sr. House, the Pilot Hill and Seaweed Lane Historic District, Spring 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 25 (Historic Properties Treatment Plan for the Revolution Wind Farm: Thirty-One Historic Properties, Town of New Shoreham, Washington County, Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Development and Implementation of the Coastal Resiliency Plan

1) Revolution Wind will provide funding to develop and implement a Coastal Resiliency Plan to protect the coastal historic properties and associated historic settings in New Shoreham as described in Attachment 25.

2) Revolution Wind will develop the project consistent with the SOI Standards for Treatment of Historic Properties (36 CFR 68); the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); the Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations, as applicable; and the Town of New Shoreham Historic District Commission guidance and regulations, as applicable.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft plan, final plan, and as-built documentation to the interested consulting parties for review.

b. Town-wide National Register of Historic Places Nomination

1) Revolution Wind will provide funding to recognize and document the historic and cultural significance in New Shoreham by completing NRHP Nomination for the entire Town of New Shoreham as described in Attachment 25.

2) Revolution Wind will develop the project consistent with the SOI Guidance on the Identification of Historic Properties (36 CFR 800.4); SOI Professional Qualification Standards (36 CFR 61); the National Park Service's (NPS) National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation, as applicable (NPS, 1997a); National Register Bulletin 16a: How to Complete the National Register Registration Form (NPS, 1997b); and RIHPHC guidance.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft of the NRHP Nomination Form; and revised draft of the NRHP Nomination Form to the interested consulting parties for review.

xx. Town of South Kingstown, Washington County, Rhode Island: *The Brownings Beach Historic District.* BOEM will include the following as described in Attachment 26 (Historic Properties Treatment Plan for the Revolution Wind Farm: The Brownings Beach Historic District, Town of South Kingstown, Washington County, Massachusetts) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Historic Context for Summer Cottage/Resort Development

1) Revolution Wind will provide funding to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries as described in Attachment 26.

2) Revolution Wind will develop the project consistent with the Secretary of the Interior's Professional Qualifications Standards (36 CFR Part 61), as applicable, RIHPHC guidance, and MHC guidance.

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, preliminary draft report, and final report to the interested consulting parties for review.

xxi. Massachusetts and Rhode Island: *Sakonnet Light Station, the Block Island North Lighthouse, the Point Judith Lighthouse, the Beavertail Light, the Tarpaulin Cove Light, the Clark's Point Light, the Butler Flats Light Station, and the Nobska Point Lighthouse.* BOEM will include the following as described in Attachment 27 (Historic Properties Treatment Plan for the Revolution Wind Farm: Eight Historic Lighthouses, Massachusetts and Rhode Island) as conditions of approval of the Revolution Wind COP. Revolution Wind will fund and commence the following prior to initiation of construction of any offshore project elements on the OCS included as part of this undertaking.

a. Assessment, Planning, Restoration, and Institutional Development

1) Revolution Wind will provide funding to support the prioritized needs of each of the eight lighthouses to enhance the long-term preservation, resiliency, and interpretation of the historic properties and will help preserve the character of existing historic shoreline settings as described in Attachment 27.

2) Revolution Wind will develop the project consistent with the applicable state and local building codes, guidance and regulations; all existing preservation restrictions and/or easements; Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character; Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings; National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation; Historic Lighthouse Preservation Handbook; IALA-AISM Lighthouse Conservation Manual; SOI Professional Qualification Standards (36 CFR 61), as applicable; and the SOI Standards for Treatment of Historic Properties (36 CFR 68).

3) Revolution Wind will submit a RFP, proposals by qualified consultants in response to the RFP, photographs and documentation of existing conditions, draft deliverables, final deliverables, and as-built documentation and photography to the interested consulting parties for review.

IV. PROJECT MODIFICATIONS

A. If Revolution Wind proposes any modifications to the Project that expands the Project beyond the Project Design Envelope included in the COP and/or occurs outside the defined APEs or the proposed modifications change BOEM's final Section 106 determinations and findings for this Project, Revolution Wind shall notify and provide BOEM with information concerning the proposed modifications. BOEM will determine if these modifications require alteration of the conclusions reached in the Finding of Effect and, thus, will require additional consultation with the signatories, invited signatories and consulting parties. If BOEM determines additional consultation is required, Revolution Wind will provide the signatories, invited signatories, and consulting parties with the information concerning the proposed changes, and they will have 30 calendar days from receipt of this information to comment on the proposed changes. BOEM shall take into account any comments from signatories, invited signatories, and consulting parties prior to agreeing to any proposed changes. Using the procedure below, BOEM will, as necessary, consult with the signatories, invited signatories, and consulting parties to identify and evaluate historic properties in any newly affected areas, assess the effects of the modification, and resolve any adverse effects.

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, BOEM, with the assistance of Revolution Wind, will notify and consult with the signatories, invited signatories, and consulting parties following the consultation process set forth in this Stipulation IV.A.1.

    i. Revolution Wind will notify all the signatories, invited signatories, and consulting parties about this proposed change and BOEM's determination by providing 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 Revolution Wind will allow the signatories, invited 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, Revolution Wind 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 Revolution Wind, 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 determines new adverse effects to historic properties will occur due to a Project modification, BOEM with the assistance of Revolution Wind will notify and consult with the signatories, invited signatories, and consulting parties regarding BOEM's finding and the proposed measures to resolve the adverse effect(s) including the development of a new treatment plan(s) following the consultation process set forth in this Stipulation IV.A. 2.

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

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

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

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

v. Revolution Wind will send the revised draft final documents to the other signatories, invited 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, Revolution Wind will provide a summary of all the comments received on the documents and BOEM's responses.

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

vii. Revolution Wind will notify all the signatories, invited signatories, and consulting parties that BOEM has approved the project modification and will provide the final document(s) including the final treatment plan(s) and a summary of comments and BOEM's responses to comments, if they receive any on the draft final documents, after BOEM has received concurrence from the appropriate SHPO(s) on the finding of new adverse effect(s), BOEM has accepted the final treatment plan(s), and BOEM has approved the Project modification.

viii. The MOA will not need to be amended after the treatment plan(s) is accepted by BOEM.

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

V. REVIEW PROCESS FOR DOCUMENTS

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

1. Draft Document

i. Revolution Wind shall provide the document to BOEM for technical review and approval

a. BOEM has 15 calendar days to complete its technical review.

b. If BOEM does not provide approval, it shall submit its comments back to Revolution Wind, who will have 15 calendar days to address the comments.

ii. BOEM, with the assistance of Revolution Wind, shall provide the draft document to consulting parties, except the ACHP, for review and comment.

a. Consulting parties shall have 30 calendar days to review and comment.

b. BOEM, with the assistance of Revolution Wind, shall coordinate a meeting with consulting parties to facilitate comments on the document if requested by a consulting party.

c. BOEM shall consolidate comments received and provide them to Revolution Wind within 15 calendar days of receiving comments from consulting parties.

2. Draft Final Document

   i. Revolution Wind shall provide BOEM with the draft final document for technical review and approval

      a. BOEM has 15 calendar days to complete its technical review.

      b. If BOEM does not provide approval, it shall submit its comments back to Revolution Wind, who will have 15 calendar days to address the comments.

   ii. BOEM, with the assistance of Revolution Wind, shall provide the draft final document to consulting parties, except the ACHP, for review and comment

      a. Consulting parties have 30 calendar days to review and comment.

      b. BOEM, with the assistance of Revolution Wind, shall coordinate a meeting with consulting parties to facilitate comments on the document if requested by a consulting party.

      c. BOEM shall consolidate comments received and provide them to Revolution Wind within 15 calendar days of receiving comments from consulting parties.

3. Final Document

   i. Revolution Wind shall 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 shall submit its comments back to Revolution Wind, who will have 15 calendar days to address the comments.

      c. BOEM, with the assistance of Revolution Wind, shall provide the final document to consulting parties, except the ACHP, within 30 calendar days of approving the final document.

VI. SUBMISSION OF DOCUMENTS

A. Connecticut, Massachusetts, New York, and Rhode Island 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. Massachusetts SHPO

      i. All submittals to the Massachusetts SHPO, if required for any HPTP, will be in paper format and delivered by U.S. Mail, delivery service, or by hand.

      ii. Plans and specifications submitted to the Massachusetts 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.

VII. 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 MOA shall 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 following applicable State guidelines. No excavation should be initiated before acceptance and approval of a curation plan.

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 shall be curated within the state of their origin at a repository preferred by the SHPO, or an approved and certified repository, in accordance with the standards and guidelines required by the RI SHPO. Lands as described here may include the seafloor in state waters. No excavation should be initiated before acceptance and approval of a curation plan.

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 land owner. In such instances, BOEM and Revolution Wind, in coordination with the SHPO, 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, Revolution Wind 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 Revolution Wind, 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 Revolution Wind will ensure that recovered artifacts and related documentation are curated in a suitable repository as agreed to by BOEM, SHPO, 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, shall be curated in accordance with 36 CFR 79. No excavation should be initiated before acceptance and approval of a curation plan.

VIII. PROFESSIONAL QUALIFICATIONS

A. Secretary's Standards for Archaeology and Historic Preservation. Revolution Wind 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. Revolution Wind 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 Standards. BOEM, or its designee, will ensure that consultants retained for services pursuant to the MOA meet these standards.

C. Investigations of ASLFs. Revolution Wind 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.

D. Tribal Consultation Experience. Revolution Wind will ensure that all work carried out pursuant to this MOA that requires consultation with Tribal Nations is performed by professionals who have demonstrated professional experience consulting with federally recognized Tribal Nations.

IX. DURATION

A. This MOA will expire at (1) the decommissioning of the Project in the lease area, as defined in Revolution Wind's lease with BOEM (Lease Number OCS-A 0486) or (2) 25-years from the date of COP approval, whichever occurs first. Prior to such time, BOEM may consult with the other signatories and invited signatories to reconsider the terms of the MOA and amend it in accordance with Amendment Stipulation (Stipulation XII).

X. POST-REVIEW DISCOVERIES

A. Implementation of Post-Review Discovery Plans. If properties are discovered that may be historically significant or unanticipated effects on historic properties found, BOEM shall implement the post-review discovery plans found in Attachments 28 (Revolution Wind Export Cable Onshore Substation and Interconnection Facility, North Kingstown, Rhode Island: Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains) and 29 (Unanticipated Discoveries Plan for Submerged Archaeological Sites, Historic Properties, and Cultural Resources Including Human Remains: Revolution Wind Farm for Lease Area OCS A-0486 Construction and Operations Plan).

1. The signatories acknowledge and agree that it is possible that additional historic properties may be discovered during 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 property or unanticipated effects to a historic property prior to or during construction, operation, maintenance, or decommissioning of the Project, Revolution Wind will implement the following actions which are consistent with the post-review discovery plan:

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;

2. Notify BOEM 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;

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 Revolution Wind on how to proceed; and

4. Conduct any additional investigations as directed by BOEM or its designee to determine if the resource is eligible for listing in the NRHP (30 CFR 585.802(b)). BOEM will direct Revolution Wind to complete additional investigations, as BOEM deems appropriate, if:

i. the site has been impacted by Revolution Wind Project activities; or

ii. impacts to the site from Revolution Wind Project activities cannot be avoided.

5. If investigations indicate that the resource is eligible for the NRHP, BOEM, with the assistance of Revolution Wind, will work with the other relevant signatories, invited 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, Revolution Wind will contact the Tribal Nations (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) 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.

7. If BOEM incurs costs in addressing the discovery, under Section 110(g) of the NHPA, BOEM may charge Revolution Wind reasonable costs for carrying out historic preservation responsibilities, pursuant to its delegated authority under the OCS Lands Act (30 CFR 585.802 (c-d)).

XI. 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, Revolution Wind 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 shall include a description of how the stipulations relating to avoidance, minimization, and mitigation measures (Stipulations I, II, and III) 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. Revolution Wind can satisfy its reporting requirement under this stipulation by providing the relevant portions of the annual compliance certification required under 30 CFR 585.633.

XII. DISPUTE RESOLUTION

A. Should 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 shall 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 shall 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 shall 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. If the ACHP does not provide its advice regarding the dispute within the 30 calendar-day time period, BOEM may make a final decision on the dispute and proceed accordingly. Prior

to reaching such a final decision, BOEM shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories, invited signatories, or consulting parties to the MOA, and provide them and the ACHP with a copy of such written response.

B. BOEM'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, should a member of the public object 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 shall review the objection and may notify the other signatories as appropriate, and respond to the objector.

XIII. AMENDMENTS

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

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

XIV. TERMINATION

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

B. 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 shall notify the signatories and invited signatories as to the course of action it will pursue.

XV. 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 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 the Amendment Stipulation (Stipulation XII).

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 XII 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, invited 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.

XVI. ANTI-DEFICIENCY ACT

A. Pursuant to 31 USC 1341(a)(1), nothing in this MOA will be construed as binding the United States to expend in any one fiscal year any sum in excess of appropriations made by Congress for this purpose, or to involve the United States in any contract or obligation for the further expenditure of money in excess of such appropriations.

B. Execution of this MOA by BOEM, the Connecticut, Massachusetts, New York, and Rhode Island SHPOs, 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 FOLLOWING PAGE]

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Signatory:

Bureau of Ocean Energy Management (BOEM)

____________________________________ Date:______________
Amanda Lefton
Director
Bureau of Ocean Energy Management

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Signatory:

Connecticut State Historic Preservation Officer (SHPO)

______________________________ Date:______________

Catherine Labadia
Deputy State Historic Preservation Officer
Connecticut State Historic Preservation Office

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Signatory:

Rhode Island State Historic Preservation Officer (SHPO)

____ Date:_______________

Jeffrey Emidy
Interim Executive Director and State Historic Preservation Officer
Rhode Island Historical Preservation & Heritage Commission

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Signatory:

New York State Historic Preservation Officer (SHPO)

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

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Signatory:

Massachusetts State Historic Preservation Officer (SHPO)

____________________________________ Date:_______________
Brona Simon
State Historic Preservation Officer
Massachusetts Historical Commission

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Signatory:

Advisory Council on Historic Preservation (ACHP)

_________________________________ Date:______________

Reid J. Nelson
Acting Executive Director
Advisory Council on Historic Preservation

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Invited Signatory:

Revolution Wind, LLC

_______________________________ Date:______________

Kellen Ingalls
Authorized Person
Revolution Wind, LLC

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

Mashpee Wampanoag Tribe

______________________________________ Date:______________

[Name]
[Title]
Mashpee Wampanoag Tribe

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

Shinnecock Indian Nation

___________________________________ Date:______________

[Name]
[Title]
Shinnecock Indian Nation

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
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AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

Mashantucket Pequot Tribal Nation

________________________________ Date:______________

[Name]
[Title]
Mashantucket Pequot Tribal Nation

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Concurring Party:

Wampanoag Tribe of Gay Head (Aquinnah)

____________________________________ Date:______________
[Name]
[Title]
Wampanoag Tribe of Gay Head (Aquinnah)

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

Mohegan Tribe of Indians of Connecticut

____________________________________ Date:_______________
[Name]
[Title]
Mohegan Tribe of Indians of Connecticut

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

Narragansett Indian Tribe

__________________________________ Date:______________

[Name]
[Title]
Narragansett Indian Tribe

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
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REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

The Delaware Tribe of Indians

___________________________________ Date:_______________

[Name]
[Title]
The Delaware Tribe of Indians

MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
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AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT

Concurring Party:

The Delaware Nation

___________________________________ Date:______________

[Name]
[Title]
The Delaware Nation

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

Concurring Party:

Organization

____________________________________ Date:______________
Name
Title
Organization

**MEMORANDUM OF AGREEMENT
AMONG THE BUREAU OF OCEAN ENERGY MANAGEMENT,
THE STATE HISTORIC PRESERVATION OFFICERS OF CONNECTICUT,
MASSACHUSETTS, NEW YORK, AND RHODE ISLAND,
AND THE ADVISORY COUNCIL ON HISTORIC PRESERVATION
REGARDING THE REVOLUTION WIND OFFSHORE WIND FARM PROJECT**

LIST OF ATTACHMENTS TO THE MOA

ATTACHMENT 1 – PROGRAMMATIC AGREEMENT

ATTACHMENT 2 – APE MAPS

ATTACHMENT 3 – ABOVE GROUND HISTORIC PROPERTIES ADVERSELY AFFECTED BY THE PROJECT

ATTACHMENT 4 – LISTS OF INVITED AND PARTICIPATING CONSULTING PARTIES

ATTACHMENT 5 – HISTORIC PROPERTY TREATMENT PLAN FOR THE REVOLUTION WIND FARM ANCIENT SUBMERGED LANDFORMS, OUTER CONTINENTAL SHELF, FEDERAL AND RHODE ISLAND WATERS OF RHODE ISLAND SOUND

ATTACHMENT 6 – HISTORIC PROPERTY TREATMENT PLAN FOR THE REVOLUTION WIND FARM, THE [redacted] #1 AND #2 SITES, TOWN OF NORTH KINGSTOWN, WASHINGTON COUNTY, RHODE ISLAND

ATTACHMENT 7 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE [redacted] TRADITIONAL CULTURAL PROPERTY [redacted], MASSACHUSETTS & ATLANTIC OUTER CONTINENTAL SHELF

ATTACHMENT 8 – THE [redacted] TRADITIONAL CULTURAL PROPERTY [redacted], MASSACHUSETTS & ATLANTIC OUTER CONTINENTAL SHELF

ATTACHMENT 9 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: SALTER'S POINT, TOWN OF DARTMOUTH, BRISTOL COUNTY, MASSACHUSETTS

ATTACHMENT 10 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: 744 SCONTICUT NECK ROAD, TOWN OF FAIRHAVEN, BRISTOL COUNTY, MASSACHUSETTS

ATTACHMENT 11 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE FORT TABER HISTORIC DISTRICT AND THE FORT RODMAN HISTORIC DISTRICT, TOWN OF NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS

ATTACHMENT 12 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: SEVEN HISTORIC PROPERTIES, TOWN OF WESTPORT, BRISTOL COUNTY, MASSACHUSETTS

ATTACHMENT 13 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM, NINE HISTORIC PROPERTIES SUBJECT TO ADVERSE EFFECTS IN THE TOWN OF AQUINNAH, DUKES COUNTY, MASSACHUSETTS

ATTACHMENT 14 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE GAY HEAD LIGHTHOUSE, TOWN OF AQUINNAH, DUKES COUNTY, MASSACHUSETTS

ATTACHMENT 15 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: CAPT. SAMUEL HANCOCK – CAPT. WEST MITCHELL HOUSE, RUSSELL HANCOCK HOUSE, RUSSELL HANCOCK HOUSE, ERNEST FLANDERS HOUSE, BARN, AND SHOP, SIMON MAYHEW HOUSE, AND FLAGHOLE, TOWN OF CHILMARK, DUKES COUNTY, MASSACHUSETTS

ATTACHMENT 16 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE SCRUBBY NECK SCHOOLHOUSE, TOWN OF WEST TISBURY, DUKES COUNTY, MASSACHUSETTS

ATTACHMENT 17 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE KAY STREET-CATHERINE STREET-OLD BEACH ROAD HISTORIC DISTRICT/THE HILL, THE OCHRE POINT – CLIFFS HISTORIC DISTRICT, AND THE OCEAN DRIVE HISTORIC DISTRICT NATIONAL HISTORIC LANDMARK, CITY OF NEWPORT, NEWPORT COUNTY, RHODE ISLAND

ATTACHMENT 18 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BELLEVUE AVENUE HISTORIC DISTRICT, ROSECLIFF, THE BEAKERS, AND THE MARBLE HOUSE, CITY OF NEWPORT, NEWPORT COUNTY, RHODE ISLAND

ATTACHMENT 19 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: HORSEHEAD/MARBELLA, TOWN OF JAMESTOWN, NEWPORT COUNTY, RHODE ISLAND

ATTACHMENT 20 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE ABBOTT PHILLIPS HOUSE, THE STONE HOUSE INN, THE WARREN'S POINT HISTORIC DISTRICT, AND TUNIPUS GOOSEWING FARM, TOWN OF LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

ATTACHMENT 21 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: NINE HISTORIC PROPERTIES, TOWN OF MIDDLETOWN, NEWPORT COUNTY, RHODE ISLAND

ATTACHMENT 22 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: PUCATEST NECK HISTORIC DISTRICT, TOWN OF TIVERTON, NEWPORT COUNTY, WASHINGTON COUNTY, RHODE ISLAND

ATTACHMENT 23 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: EIGHT HISTORIC PROPERTIES, TOWN OF NARRAGANSETT, WASHINGTON COUNTY, RHODE ISLAND

ATTACHMENT 24 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BLOCK ISLAND SOUTHEAST LIGHTHOUSE NATIONAL HISTORIC LANDMARK, TOWN OF NEW SHOREHAM, WASHINGTON COUNTY, RHODE ISLAND

ATTACHMENT 25 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THIRTY-ONE HISTORIC PROPERTIES, TOWN OF NEW SHOREHAM, WASHINGTON COUNTY, RHODE ISLAND

ATTACHMENT 26 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BROWNINGS BEACH HISTORIC DISTRICT, TOWN OF SOUTH KINGSTOWN, WASHINGTON COUNTY, MASSACHUSETTS

ATTACHMENT 27 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: EIGHT HISTORIC LIGHTHOUSES, MASSACHUSETTS AND RHODE ISLAND

ATTACHMENT 28 – REVOLUTION WIND EXPORT CABLE ONSHORE SUBSTATION AND INTERCONNECTION FACILITY, NORTH KINGSTOWN, RHODE ISLAND: PROCEDURES GUIDING THE DISCOVERY OF UNANTICIPATED CULTURAL RESOURCES AND HUMAN REMAINS

ATTACHMENT 29 – UNANTICIPATED DISCOVERIES PLAN FOR SUBMERGED ARCHAEOLOGICAL SITES, HISTORIC PROPERTIES, AND CULTURAL RESOURCES INCLUDING HUMAN REMAINS: REVOLUTION WIND FARM FOR LEASE AREA OCS A-0486 CONSTRUCTION AND OPERATIONS PLAN

ATTACHMENT 1 –PROGRAMMATIC AGREEMENT

[Insert ATTACHMENT 1 – PROGRAMMATIC AGREEMENT]

MAY 23 2012

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 Islands

WHEREAS, the Energy Policy Act of 2005, Pub. L. No. 109-58, added Section 8(p)(1)(C) to the Outer Continental Shelf Lands Act (OCSLA), which grants the Secretary of the Interior the authority to issue leases, easements, or rights-of-way on the Outer Continental Shelf (OCS) for the purpose of renewable energy development, including wind energy development. *See* 43 U.S.C. § 1337(p)(1)(C); and

WHEREAS, the Secretary delegated this authority to the former Minerals Management Service (MMS), now the Bureau of Ocean Energy Management (BOEM), and promulgated final regulations implementing this authority at 30 CFR Part 585; and

WHEREAS, under the renewable energy regulations, the issuance of leases and subsequent approval of wind energy development on the OCS is a staged decision-making process that occurs in distinct phases: lease issuance; approval of a site assessment plan (SAP); and approval of a construction and operation plan (COP); and

WHEREAS, BOEM is currently identifying areas that may be suitable for wind energy leasing through collaborative, consultative, and analytical processes; and

WHEREAS, the issuance of a commercial wind energy lease gives the lessee the exclusive right to subsequently seek BOEM approval of plans (SAPs and COPs) for the development of the leasehold; and

WHEREAS, the lease does not grant the lessee the right to construct any facilities; rather, the lease grants the lessee the right to use the leased area to develop its plans, which must be approved by BOEM before the lessee implements them. *See* 30 CFR 585.600 and 585.601; and

WHEREAS, the SAP contains the lessee's detailed proposal for the construction of a meteorological tower and/or the installation of meteorological buoys ("site assessment activities") on the leasehold. *See* 30 CFR 585.605 - 585.618; and

WHEREAS, the lessee's SAP must be approved by BOEM before it conducts these "site assessment" activities on the leasehold; and

WHEREAS, BOEM may approve, approve with modification, or disapprove a lessee's SAP. *See* 30 CFR 585.613; and

WHEREAS, the COP is a detailed plan for the construction and operation of a wind energy project on the lease. *See* 30 CFR 585.620-585.638; and

WHEREAS, BOEM approval of a COP is a precondition to the construction of any wind energy facility on the OCS. *See* 30 CFR 585.600; and

WHEREAS, the regulations require that a lessee provide the results of surveys with its SAP and COP for the areas affected by the activities proposed in each plan, including an archaeological resource survey. *See* 30 CFR 585.610(b)(3) and 30 CFR 585.626(a)(5). BOEM refers to surveys undertaken to acquire this information as "site characterization" activities. *See Guidelines for Providing Geological and Geophysical, Hazards, and Archaeological Information Pursuant to 30 CFR Part 585* at: http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/GGARCH4-11-2011-pdf.aspx; and

WHEREAS, BOEM has embarked upon the "Smart from the Start" Atlantic Wind Energy Initiative for the responsible development of wind energy resources on the Atlantic OCS; and

WHEREAS, under the "Smart from the Start" Initiative, BOEM has identified areas on the OCS that appear most suitable for future wind energy activities offshore the Commonwealth of Massachusetts (MA) and the State of Rhode Island (RI); and

WHEREAS these areas are located: (1) within the Rhode Island-Massachusetts Wind Energy Area (WEA); and (2) within the MA Call area east of the Rhode Island-Massachusetts WEA (hereafter known as "Areas"); and

WHEREAS BOEM may issue multiple renewable energy leases and approve multiple SAPs on leases issued within these Areas; and

WHEREAS, BOEM has determined that issuing leases and approving SAPs within these Areas constitute multiple undertakings subject to Section 106 of the National Historic Preservation Act (NHPA; 16 U.S.C. § 470f), and its implementing regulations (36 CFR 800); and

WHEREAS, BOEM has determined that the implementation of the program is complex as the decisions on these multiple undertakings are staged, pursuant to 36 CFR § 800.14(b); and

WHEREAS, the implementing regulations for Section 106 (36 CFR § 800) prescribe a process that seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among parties with an interest in the effects of the undertakings, commencing at the early stages of the process; and

WHEREAS, the Section 106 consultations have been initiated and coordinated with other reviews, including the National Environmental Policy Act (NEPA), in accordance with 36 CFR § 800.3(b); and

WHEREAS, 36 CFR § 800.14(b)(3) provides for developing programmatic agreements (Agreements) for complex or multiple undertakings and § 800.14(b)(1)(ii) and (v) provide for developing Agreements when effects on historic properties cannot be fully determined prior to approval of an undertaking and for other circumstances warranting a departure from the normal section 106 process; and

WHEREAS, 36 CFR § 800.4(b)(2) provides for phased identification and evaluation of historic properties where alternatives consist of large land areas, and for the deferral of final identification and evaluation of historic properties when provided for in a Agreement executed pursuant to 36 CFR §800.14(b); and

WHEREAS, BOEM has determined that the identification and evaluation of historic properties shall be conducted through a phased approach, pursuant to 36 CFR § 800.4(b)(2), where the final identification of historic properties will occur after the issuance of a lease or leases and before the approval of a SAP; and

WHEREAS, the Section 106 consultations described in this Agreement will be used to establish a process for identifying historic properties located within the undertakings' Areas of Potential Effects (APE) that are listed in or eligible for listing in the National Register of Historic Places (National Register), and assess the potential adverse effects and avoid, reduce, or resolve any such effects through the process set forth in this Agreement; and

WHEREAS, according to 36 CFR § 800.16(l)(1) "historic property" means

> *any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria*; and

WHEREAS, the APEs, as defined in 36 CFR § 800.16(d) of the Advisory Council on Historic Preservation's (ACHP's) regulations implementing Section 106 of the NHPA, for the undertakings that are the subject of this Agreement, are: (1) the depth and breadth of the seabed that could potentially be impacted by seafloor/bottom-disturbing activities associated with the undertakings (e.g., core samples, anchorages and installation of meteorological towers and buoys); and (2) the viewshed from which lighted meteorological structures would be visible; and

WHEREAS, BOEM has identified and consulted with the State Historic Preservation Offices (SHPOs) for MA and RI, (collectively, "the SHPOs"); and

WHEREAS, BOEM initiated consultation in 2011 and 2012 through letters of invitation, telephone calls, emails, meetings, webinars, and the circulation and discussion of this Agreement in draft; and this outreach and notification included contacting over 66 individuals and entities, including federally-recognized Indian Tribes (Tribes), local governments, SHPOs, and the public; and

WHEREAS, BOEM has initiated formal government-to-government consultation with the following Tribes: the Mashpee Wampanoag Tribe, the Narragansett Indian Tribe, the Shinnecock Indian Nation, and the Wampanoag Tribe of Gay Head (Aquinnah); and

WHEREAS, these Tribes have chosen to consult with BOEM and participate in development of this Agreement, in which the term Tribe refers to them, within the meaning of 36 CFR § 800.16(m); and

WHEREAS, BOEM shall continue to consult with these Tribes to identify properties of religious and cultural significance that may be eligible for listing in the National Register of Historic Places (Traditional Cultural Properties or TCPs) and that may be affected by these undertakings; and

WHEREAS, BOEM involves the public and identifies other consulting parties through notifications, requests for comments, existing renewable energy task forces, contact with SHPOs, NEPA scoping meetings and communications for these proposed actions; and

WHEREAS, BOEM, the SHPOs, the Mashpee Wampanoag Tribe, the Narragansett Indian Tribe, and the Wampanoag Tribe of Gay Head (Aquinnah) and the ACHP are Signatories to this Agreement, and

WHEREAS, future submission of a COP and commercial-scale development that may or may not occur within the Areas would be separate undertakings and considered under future, separate Section 106 consultation(s) not under this Agreement; and

WHEREAS, BOEM requires a SAP to include the results of site characterization surveys that will identify potential archaeological resources that could be affected by the installation and operation of meteorological facilities. *See* (30 CFR § 585.611 (b)(6); and

WHEREAS, consultations conducted prior to the execution of this Agreement included all steps in the Section 106 process up to and including consulting on the scope of identification efforts that would be used to conduct site characterization surveys that would identify historic properties that may be impacted by activities described in the SAP pursuant to 36 CFR § 800.4(a); and

WHEREAS, these consultations resulted in recommendations to BOEM that the following items should be added to leases issued within the Areas, both to ensure that historic properties that may be impacted by activities described in the SAP are identified through a reasonable and good faith effort (§ 800.4(b)(1)), and also to ensure that properties identified through the geophysical surveys are not impacted by geotechnical sampling:

> *The lessee may only conduct geotechnical (sub-bottom) sampling activities in areas of the leasehold in which an analysis of the results of geophysical surveys has been completed for that area. The geophysical surveys must meet BOEM's minimum standards (see Guidelines for Providing Geological and Geophysical, Hazards, and Archaeological Information Pursuant to 30 CFR Part 285 at* http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/GGARCH4-11-2011-pdf.aspx*), and the analysis must be completed by a qualified marine archaeologist who both meets the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738- 44739) and has experience analyzing marine geophysical data. This analysis must include a determination whether any potential archaeological resources are present in the area and the geotechnical (sub-bottom) sampling activities must avoid potential archaeological resources by a minimum of 50.0 meters (m; 164.0 feet). The avoidance distance must be calculated from the maximum discernible extent of the archaeological resource. In no case may the lessee's actions impact a potential archaeological resource without BOEM's prior approval*;

NOW, THEREFORE, BOEM, the ACHP, the SHPOs, Tribes, and the other concurring parties (the Parties), agree that Section 106 consultation shall be conducted in accordance with the following stipulations in order to defer final identification and evaluation of historic properties.

STIPULATIONS

I. SAP Decisions. Before making a decision on a SAP from a lessee, BOEM will treat all potential historic properties identified as a result of site characterization studies and consultations as historic properties potentially eligible for inclusion on the National Register and avoid them by requiring the lessee to relocate the proposed project, resulting in a finding of *No historic properties affected* (36 CFR § 800.4(d)(1)). If a potential historic property is identified, and the lessee chooses to conduct additional investigations, and:

   A. If additional investigations demonstrate that a historic property does not exist, then BOEM will make a determination of *No historic properties affected* and follow 36 CFR § 800.4(d)(1).

B. If additional investigations demonstrate that a historic property does exist and may be affected, BOEM will evaluate the historic significance of the property, in accordance with 800.4(c); make a determination of *Historic properties affected* and follow 36 CFR § 800.4(d)(2); and resolve any adverse effects by following 800.5.

II. Tribal Consultation. BOEM shall continue to consult with the Tribes throughout the implementation of this Agreement in a government-to-government manner consistent with Executive Order 13175, Presidential memoranda, and any Department of the Interior policies, on subjects related to the undertakings.

III. Public Participation

A. Because BOEM and the Parties recognize the importance of public participation in the Section 106 process, BOEM shall continue to provide opportunities for public participation in Section 106-related activities, and shall consult with the Parties on possible approaches for keeping the public involved and informed throughout the term of the Agreement.

B. BOEM shall keep the public informed and may produce reports on historic properties and on the Section 106 process that may be made available to the public at BOEM's headquarters, on the BOEM website, and through other reasonable means insofar as the information shared conforms to the confidentiality clause of this Agreement (Stipulation IV).

IV. Confidentiality. Because BOEM and the Parties agree that it is important to withhold from disclosure sensitive information such as that which is protected by NHPA Section 304 (16 U.S.C. § 470w-3) (*e.g.*, the location, character and ownership of an historic resource, if disclosure would cause a significant invasion of privacy, risk harm to the historic resources, or impede the use of a traditional religious site by practitioners), BOEM shall:

A. Request that each Party inform the other Parties if, by law or policy, it is unable to withhold sensitive data from public release.

B. Arrange for the Parties to consult as needed on how to protect such information collected or generated under this Agreement.

C. Follow, as appropriate, 36 CFR 800.11(c) for authorization to withhold information pursuant to NHPA Section 304, and otherwise withhold sensitive information to the extent allowable by laws including the Freedom of Information Act, 5 U.S.C. § 552, through the Department of the Interior regulations at 43 CFR Part 2.

D. Request that the Parties agree that materials generated during consultation be treated by the Parties as internal and pre-decisional until they are formally released, although the Parties understand that they may need to be released by one of the Parties if required by law.

V. Administrative Stipulations

A. In coordinating reviews, BOEM shall follow this process:

1. Standard Review: The Parties shall have a standard review period of thirty (30) calendar days for commenting on all documents which are developed under the terms of this Agreement, from the date they are sent by BOEM.

2. Expedited Request for Review: The Parties recognize the time-sensitive nature of this work and shall attempt to expedite comments or concurrence when BOEM so requests. The expedited comment period shall not be less than fifteen (15) calendar days from the date BOEM sends such a request.

3. If a Party cannot meet BOEM's expedited review period request, it shall notify BOEM in writing within the fifteen (15) calendar day period. If a Party fails to provide comments or respond within the time frame requested by BOEM (either standard or expedited), then BOEM may proceed as though it has received concurrence from that Party. BOEM shall consider all comments received within the review period.

4. All Parties will send correspondence and materials for review via electronic media unless a Party requests, in writing, that BOEM transmit the materials by an alternate method specified by that Party. Should BOEM transmit the review materials by the alternate method, the review period will begin on the date the materials were received by the Party, as confirmed by delivery receipt.

5. MA and RI SHPO Review Specifications: All submittals to the MA and RI SHPOs shall be in paper format and shall be delivered to the MA and RI SHPOs' offices by US Mail, by a delivery service, or by hand. Plans and specifications submitted to the MA and RI SHPOs shall measure no larger than 11" x 17" paper format (unless another format is specified in consultation). The MA and RI SHPOs shall review and comment on all adequately documented project submittals within 30 calendar days of receipt unless a response has been requested within the expedited review period specified in Stipulation V.A.2.

6. Each Signatory shall designate a point of contact for carrying out this Agreement and provide this contact's information to the other Parties, updating it as necessary while this Agreement is in force. Updating a point of contact alone shall not necessitate an amendment to this Agreement.

B. Dispute Resolution. Should any Signatory object in writing to BOEM regarding an action carried out in accordance with this Agreement, or lack of compliance with the terms of this Agreement, the Signatories shall consult to resolve the objection. Should the Signatories be unable to resolve the disagreement, BOEM shall forward its background information on the dispute as well as its proposed resolution of the dispute to the ACHP. Within 45 calendar days after receipt of all pertinent documentation, the ACHP shall either: (1) provide BOEM with written recommendations, which BOEM shall take into account in reaching a final decision regarding the dispute; or (2) notify BOEM that it shall comment pursuant to 36 CFR 800.7(c), and proceed to comment. BOEM shall take this ACHP comment into account, in accordance with 36 CFR 800.7(c)(4). Any ACHP recommendation or comment shall be understood to pertain only to the subject matter of the dispute; BOEM's responsibility to carry out all actions under this Agreement that are not subjects of dispute shall remain unchanged.

C. Amendments. Any Signatory may propose to BOEM in writing that the Agreement be amended, whereupon BOEM shall consult with the Parties to consider such amendment. This Agreement may then be amended when agreed to in writing by all Signatories, becoming effective on the date that the amendment is executed by the ACHP as the last Signatory.

D. Adding Federal Agencies. In the event that another Federal agency believes it has Section 106 responsibilities related to the undertakings which are the subject of this Agreement, that agency may attempt to satisfy its Section 106 responsibilities by agreeing in writing to the terms of this Agreement and notifying and consulting with the SHPOs and the ACHP. Any modifications to this agreement that may be necessary for meeting that agency's Section 106 obligations shall be considered in accordance with this Agreement.

E. Adding Concurring Parties. In the event that another party wishes to assert its support of this Agreement, that party may prepare a letter indicating its concurrence, which BOEM will attach to the Agreement and circulate among the Signatories.

F. Term of Agreement. The Agreement shall remain in full force until BOEM makes a final decision on the last SAP submitted under a lease issued under this portion of the "Smart from the Start" initiative, or for ten (10) years from the date the Agreement is executed, defined as the date the last signatory signs, whichever is earlier, unless otherwise extended by amendment in accordance with this Agreement.

G. Termination.

1. If any Signatory determines that the terms of the Agreement cannot or are not being carried out, that Party shall notify the other Signatories in writing and consult with them to seek amendment of the Agreement. If within sixty (60) calendar days, an amendment cannot be made, any Signatory may terminate the Agreement upon written notice to the other Signatories.

2. If termination is occasioned by BOEM’s final decision on the last SAP contemplated under this portion of the “Smart from the Start” Initiative, BOEM shall notify the Parties and the public, in writing.

H. Anti-Deficiency Act. Pursuant to 31 U.S.C. § 1341(a)(1), nothing in this Agreement shall be construed as binding the United States to expend in any one fiscal year any sum in excess of appropriations made by Congress for this purpose, or to involve the United States in any contract or obligation for the further expenditure of money in excess of such appropriations.

I. Existing Law and Rights. Nothing in this Agreement shall abrogate existing laws or the rights of any consulting party or agency party to this Agreement.

J. Compliance with Section 106. Execution and implementation of this Agreement evidences that BOEM has satisfied its Section 106 responsibilities for all aspects of these proposed undertakings by taking into account the effects of these undertakings on historic properties and affording the ACHP a reasonable opportunity to comment with regard to the undertakings.

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

By:

Maureen A. Bornholdt Date: 5-23-12

Maureen A. Bornholdt
Program Manager, Office of Renewable Energy Programs
Bureau of Ocean Energy Management

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

Brona Simon Date: 5/31/12

Brona Simon
Massachusetts Historical Commission
Massachusetts State Historic Preservation Officer

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

Edward F. Sanderson

Date: 6/4/2012

[NAME]
[TITLE]
Rhode Island State Historic Preservation Officer

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

______________________________ Date: 05 June 2012

John Brown
Tribal Historic Preservation Officer
Narragansett Indian Tribe

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

Cedric Cromwell Date: 5/29/12

Cedric Cromwell
Tribal Chairman
Mashpee Wampanoag Tribe

Programmatic Agreement concerning the "Smart from the Start" Atlantic Wind Energy Initiative: Leasing and Site Assessment Activities offshore Massachusetts and Rhode Island

John M. Fowler Date: 6/8/12

John M. Fowler
Executive Director
Advisory Council on Historic Preservation

ATTACHMENT 2 – AREA OF POTENTIAL EFFECTS MAPS
[Insert ATTACHMENT 2 – APE MAPS]

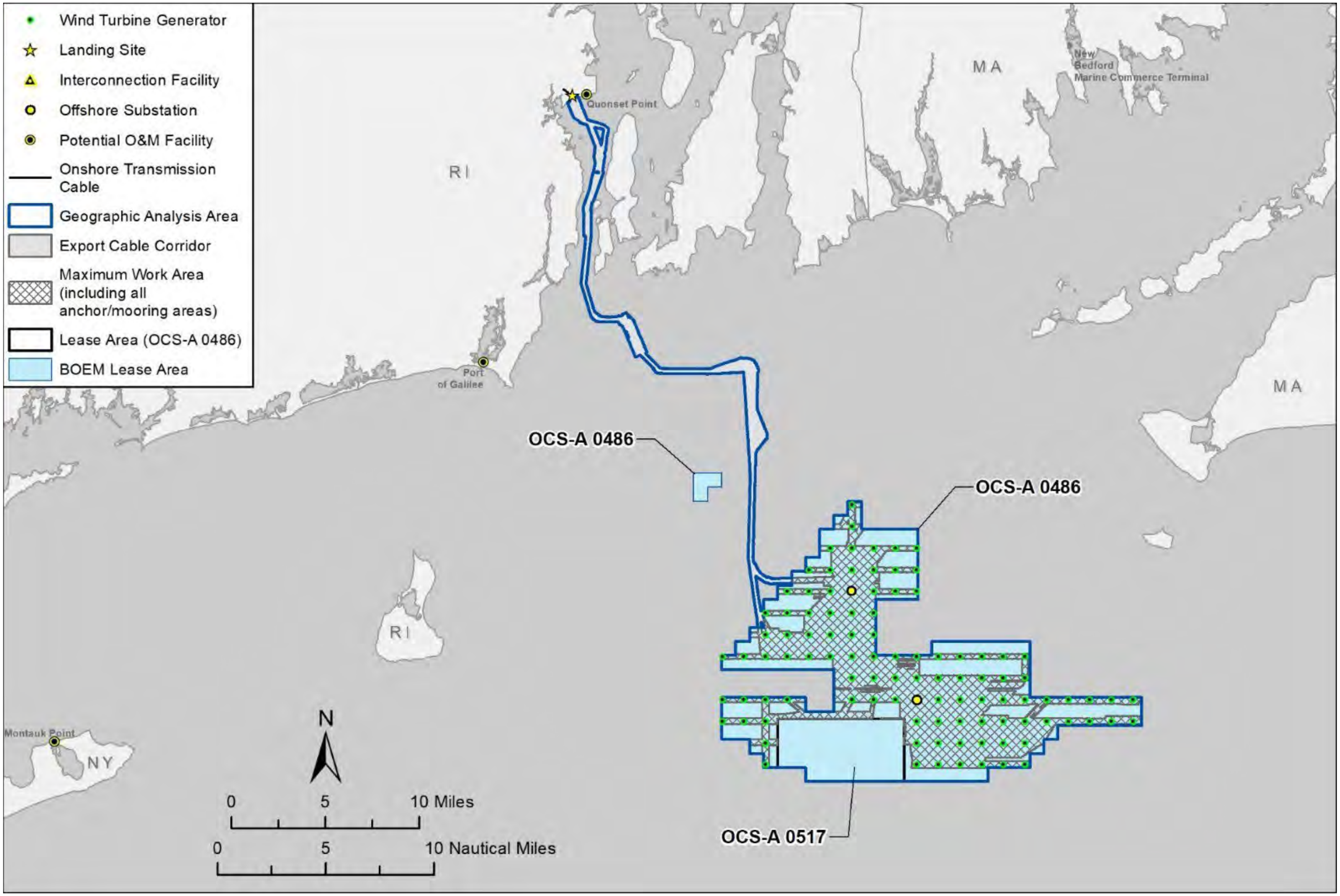

Figure 1. Revolution Wind construction and operations plan proposed offshore Project elements.

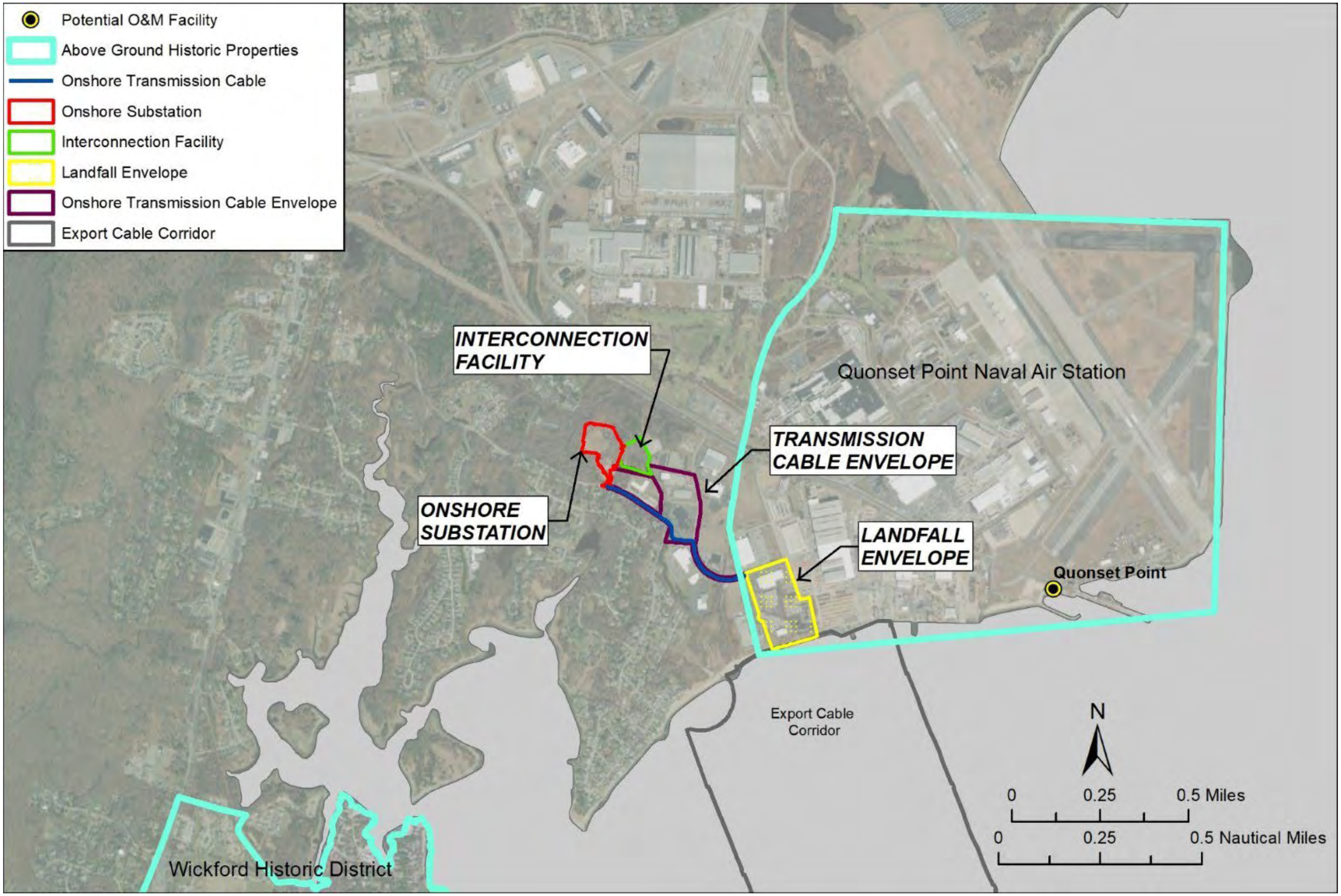

Figure 2. Revolution Wind construction and operations plan proposed onshore Project elements.

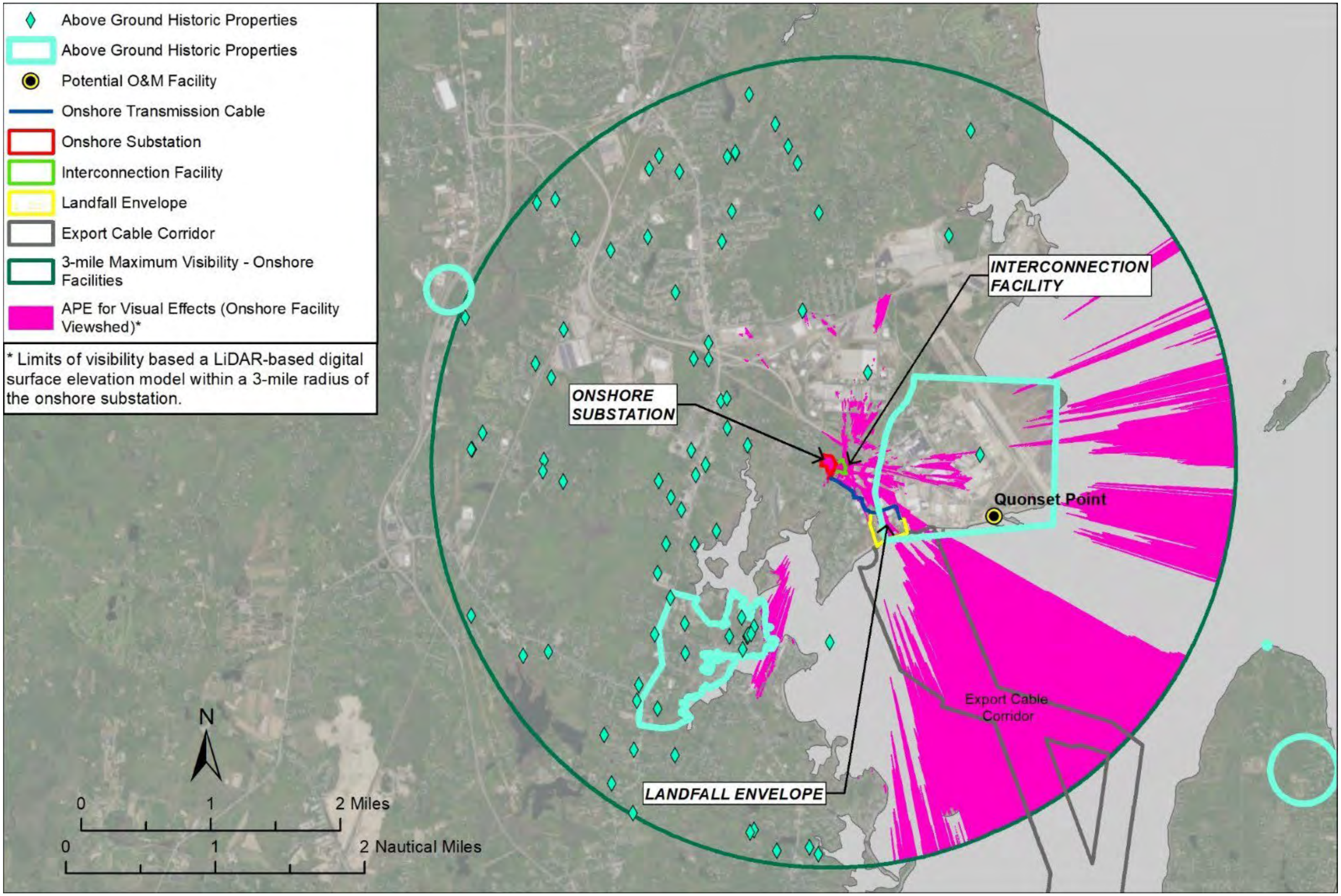

Figure 3. Visual area of potential effects and visual effects assessment geographic analysis area – onshore.

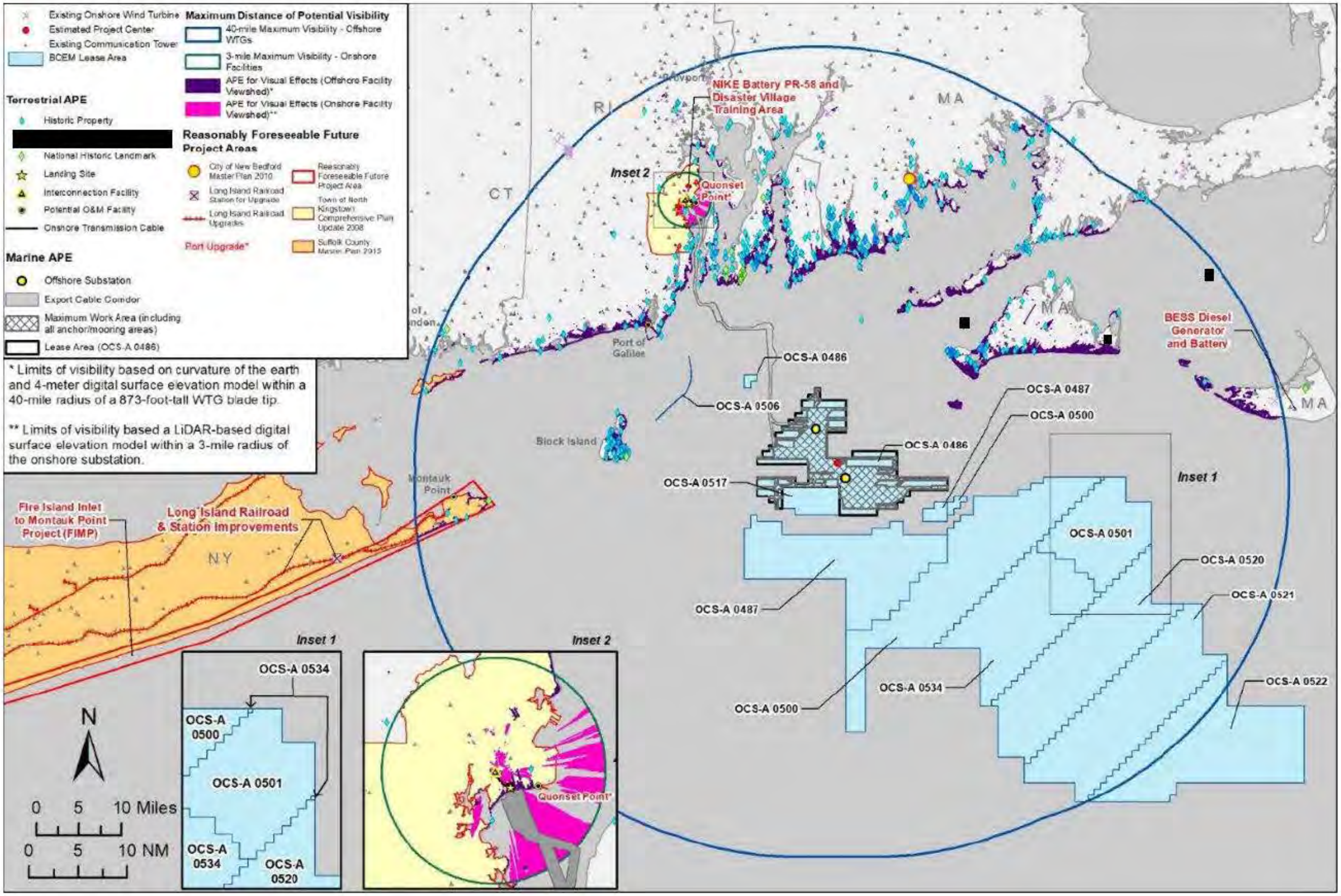

Figure 4. Visual area of potential effects and visual effects assessment geographic analysis area – offshore.

ATTACHMENT 3 – ABOVE GROUND HISTORIC PROPERTIES ADVERSELY AFFECTED BY THE PROJECT

Table 1. Above Ground Historic Properties Adversely Affected by the Project, in Order of Nearest Distance to Project WTGs

Survey ID	Visually Sensitive Resource	Municipality	County	State	Property Designation	Distance to nearest RWF WTG (miles)
TCP-3	[redacted] TCP	[redacted]	[redacted]	MA	NRHP-eligible (BOEM determined)	6*
300	Sakonnet Light Station	Little Compton	Newport	RI	NRHP-listed resource	12.7
297	Warren Point Historic District	Little Compton	Newport	RI	NRHP-eligible resource (RIHPHC determined)	12.9
299	Abbott Phillips House	Little Compton	Newport	RI	RIHPHC historic resource	13
504	Flaghole	Chilmark	Dukes	MA	MHC historic inventory site	13.3
296	Stone House Inn	Little Compton	Newport	RI	NRHP-listed resource	13.4
503	Simon Mayhew House	Chilmark	Dukes	MA	MHC historic inventory site	13.5
474	Flanders, Ernest House, Shop, Barn	Aquinnah	Dukes	MA	MHC historic inventory site	13.8
496	71 Moshup Trail	Aquinnah	Dukes	MA	MHC historic inventory site	13.7
484	Vanderhoop, Edwin DeVries Homestead	Aquinnah	Dukes	MA	NRHP-listed resource	13.7
480	Gay Head - Aquinnah Shops Area	Aquinnah	Dukes	MA	MHC historic inventory site	13.7
495	3 Windy Hill Drive	Aquinnah	Dukes	MA	MHC historic inventory site	13.9
479	Gay Head Light	Aquinnah	Dukes	MA	NRHP-listed resource	13.9
485	Tom Cooper House	Aquinnah	Dukes	MA	MHC historic inventory site	14
497	Leonard Vanderhoop House	Aquinnah	Dukes	MA	MHC historic inventory site	14
490	Theodore Haskins House	Aquinnah	Dukes	MA	MHC historic inventory site	14.1
486	Gay Head - Aquinnah Coast Guard Station Barracks	Aquinnah	Dukes	MA	MHC historic inventory site	14.1
491	Gay Head - Aquinnah Town Center Historic District	Aquinnah	Dukes	MA	NRHP-listed resource	14.2
303	Gooseneck Causeway	Westport	Bristol	MA	MHC historic inventory site	14.8
304	Gooseberry Neck Observation Towers	Westport	Bristol	MA	MHC historic inventory site	14.8
540	Spring Street	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	14.9
590	Capt. Mark L. Potter House	New Shoreham	Washington	RI	RIHPHC historic resource	14.9
276	Tunipus Goosewing Farm	Little Compton	Newport	RI	NRHP-Eligible Resource (RIHPHC Determined)	15
543	WWII Lookout Tower – Spring Street	New Shoreham	Washington	RI	NRHP-Eligible Resource (RIHPHC Determined)	15.1
251	Westport Harbor	Westport	Bristol	MA	MHC historic inventory site	15.2
290	Bellevue Avenue Historic District NHL	Newport	Newport	RI	NHL	15.2
548	Block Island Southeast Light	New Shoreham	Washington	RI	NHL	15.2
595	New Shoreham Historic District	New Shoreham	Washington	RI	Local Historic	15.3
536	Spring Cottage	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
531	Old Harbor Historic District	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC-determined)	15.3
538	Captain Welcome Dodge Sr.	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
541	Caleb W. Dodge Jr. House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.3
535	Spring House Hotel	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.4
545	Pilot Hill Road and Seaweed Lane	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.4
222	Ocean Drive Historic District NHL	Newport	Newport	RI	NHL	15.7
298	Marble House NHL	Newport	Newport	RI	NHL	15.7
597	Ochre Point – Cliffs Historic District	Newport	Newport	RI	NRHP-listed resource	15.8

546	WWII Lookout Tower at Sands Pond	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.8
552	Sea View Villa	Middletown	Newport	RI	RIHPHC historic resource	15.9
295	Rosecliff/Oelrichs (Hermann) House/ Mondroe (J. Edgar) House	Newport	Newport	RI	NRHP-listed resource	15.9
293	The Breakers NHL	Newport	Newport	RI	NHL	15.9
516	Corn Neck Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	15.9
302	Clam Shack Restaurant	Westport	Bristol	MA	MHC historic inventory site	15.9
301	Horseneck Point Lifesaving Station	Westport	Bristol	MA	MHC historic inventory site	15.9
553	Whetstone	Middletown	Newport	RI	RIHPHC historic resource	16
284	The Bluff/John Bancroft Estate	Middletown	Newport	RI	RIHPHC historic resource	16
288	Clambake Club of Newport	Middletown	Newport	RI	NRHP-listed resource	16
530	Old Town and Center Roads	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16
526	Beach Avenue	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.1
519	Mitchell Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.1
523	Indian Head Neck Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.2
168	Westport Pt. Revolutionary War Properties	Westport	Bristol	MA	MHC historic inventory site	16.2
261	Indian Avenue Historic District	Middletown	Newport	RI	NRHP-listed resource	16.2
278	St. Georges School	Middletown	Newport	RI	NRHP-listed resource	16.3
528	Hygeia House	New Shoreham	Washington	RI	NRHP-listed resource	16.3
527	U.S. Weather Bureau Station	New Shoreham	Washington	RI	NRHP-listed resource	16.3
549	Miss Abby E. Vaill/1 of 2 Vaill cottages	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.4
550	Hon. Julius Deming Perkins / "Bayberry Lodge"	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.4
542	Lakeside Drive and Mitchell Lane	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.5
280	Land Trust Cottages	Middletown	Newport	RI	NRHP-eligible resource (RIHPHC determined)	16.6
482	Russell Hancock House	Chilmark	Dukes	MA	MHC historic inventory site	16.6
163	Westport Point Historic District (1 of 2)	Westport	Bristol	MA	NRHP-eligible resource (MHC determined)	16.7
164	Westport Point Historic District (2 of 2)	Westport	Bristol	MA	NRHP-listed resource	16.7
551	Mohegan Cottage/Everett D. Barlow House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.7
266	Paradise Rocks Historic District	Middletown	Newport	RI	RIHPHC historic resource	16.8
547	Lewis- Dickens Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.8
525	Island Cemetery/Old Burial Ground	New Shoreham	Washington	RI	RI Historical Cemetery	16.8
279	Kay St.-Catherine St.-Old Beach Rd. Historic District/The Hill	Newport	Newport	RI	NRHP-listed resource	16.9
532	Beacon Hill Road	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.9
533	Nathan Mott Park	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	16.9
515	Block Island North Lighthouse	New Shoreham	Washington	RI	NRHP-listed resource	17.1
522	Champlin Farm	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.1
517	Hippocampus/Boy's Camp/ Beane Family	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.2
520	U.S. Lifesaving Station	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.4
518	U.S. Coast Guard Brick House	New Shoreham	Washington	RI	NRHP-eligible resource (RIHPHC determined)	17.4
521	Peleg Champlin House	New Shoreham	Washington	RI	NRHP-listed resource	17.5

469	Hancock, Captain Samuel - Mitchell, Captain West House	Chilmark	Dukes	MA	NRHP-eligible resource (MHC determined)	17.6
508	Scrubby Neck Schoolhouse	West Tisbury	Dukes	MA	MHC historic inventory site	18
345	Point Judith Lighthouse	Narragansett	Washington	RI	NRHP-listed resource	18.2
245	Bailey Farm	Middletown	Newport	RI	NRHP-listed resource	18.3
226	Beavertail Light	Jamestown	Newport	RI	NRHP-listed resource	18.4
582	Horsehead/Marbella	Jamestown	Newport	RI	NRHP-listed resource	18.6
333	Ocean Road Historic District	Narragansett	Washington	RI	NRHP-listed resource	18.9
335	Dunmere	Narragansett	Washington	RI	NRHP-listed resource	19.1
86	Puncatest Neck Historic District	Tiverton	Newport	RI	RIHPHC historic resource	19.4
576	Fort Varnum/Camp Varnum	Narragansett	Washington	RI	NRHP-eligible resource (RIHPHC determined)	19.6
156	Salters Point	Dartmouth	Bristol	MA	MHC historic inventory site	19.7
578	Dunes Club	Narragansett	Washington	RI	NRHP-listed resource	19.8
329	Life Saving Station at Narragansett Pier	Narragansett	Washington	RI	NRHP-listed resource	19.8
330	The Towers Historic District	Narragansett	Washington	RI	NRHP-listed resource	19.8
591	Narragansett Pier MRA	Narragansett	Washington	RI	NRHP-listed resource	19.8
328	The Towers/Tower Entrance of Narragansett Casino	Narragansett	Washington	RI	NRHP-listed resource	19.9
TCP-1	[redacted] TCP	[redacted]	[redacted]	MA	NRHP-eligible resource (BOEM determined)	20
343	Brownings Beach Historic District	South Kingstown	Washington	RI	NRHP-listed resource	21.8
444	Tarpaulin Cove Light	Gosnold	Dukes	MA	NRHP-listed resource	22.2
391	Clark's Point Light	New Bedford	Bristol	MA	NRHP-listed resource	24.6
390	Fort Rodman Historic District	New Bedford	Bristol	MA	NRHP-eligible resource (MHC determined)	24.6
392	Fort Taber Historic District	New Bedford	Bristol	MA	NRHP-listed resource	24.6
386	Butler Flats Light Station	New Bedford	Bristol	MA	NRHP-listed resource	25.6
389	744 Sconticut Neck Road	Fairhaven	Bristol	MA	MHC historic inventory site	25.9
449	Nobska Point Lighthouse	Falmouth	Barnstable	MA	NRHP-listed resource	28

Notes: MHC = Massachusetts Historical Commission, RIHPC = Rhode Island Historical Preservation & Heritage Commission.

ATTACHMENT 4 – LIST OF CONSULTING PARTIES

Table 1. Parties Invited to Participate in 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	National Park Service (NPS)
	National Oceanic and Atmospheric Administration – Habitat and Ecosystem Services Division
	U.S. Army Corps of Engineers, New England District
	U.S. Army Corps of Engineers, New York District
	Office of the Deputy Assistant Secretary of the Navy for Environment (DASN(E))
	Naval Facilities Engineering Systems Command Headquarters– Cultural Resources
	Naval History and Heritage Command – Underwater Archaeology Branch
	Bureau of Safety and Environmental Enforcement
	U.S. Department of Defense - Office of the Deputy Assistant Secretary of Defense (Environment), Environmental Compliance and Planning
	U.S. Department of Defense - Office of the Assistant Secretary of Defense for Sustainment
	Advisory Council on Historic Preservation
	U.S. Coast Guard -Sector SE New England
	U.S. Coast Guard - Marine Transportation Systems (CG-5PW)
	U.S. Coast Guard – First Coast Guard District
	U.S. Fish and Wildlife Service
	Environmental Protection Agency
	Federal Aviation Administration
Federally recognized Tribal Nations	Mashpee Wampanoag Tribe

Participants in the Section 106 Process	Invited Consulting Parties
	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 Tribal Nations	Chappaquiddick Tribe of Wampanoag Nation
	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
	Unkechaug Nation
Local governments	Cape Cod Commission
	City of Newport
	County of Dukes (MA)
	Town of Charlestown
	Town of East Hampton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission
	Town of Narragansett
	Town of North Kingstown
	City of Cranston
	City of East Providence
	City of Fall River
	City of New Bedford
	City of Providence
	City of Rehoboth
	City of Taunton
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Plymouth (MA)
	County of Suffolk (NY)
	Town of Acushnet
	Town of Aquinnah
	Town of Barnstable
	Town of Barrington
	Town of Berkley

Participants in the Section 106 Process	Invited Consulting Parties
	Town of Bourne
	Town of Bristol
	Town of Chilmark
	Town of Coventry
	Town of Dartmouth
	Town of Dighton
	Town of East Greenwich
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Freetown
	Town of Gosnold
	Town of Griswold
	Town of Groton
	Town of Hopkinton
	Town of Jamestown
	Town of Johnston
	Town of Lakeville
	Town of Ledyard
	Town of Little Compton
	Town of Marion
	Town of Mashpee
	Town of Mattapoisett
	Town of Middleborough
	Town of Nantucket
	Town of New Shoreham
	Town of North Stonington
	Town of Oak Bluffs
	Town of Portsmouth
	Town of Richmond
	Town of Rochester
	Town of Sandwich
	Town of Scituate
	Town of Seekonk
	Town of Somerset
	Town of South Kingstown
	Town of Southold

Participants in the Section 106 Process	Invited Consulting Parties
	Town of Stonington
	Town of Swansea
	Town of Tisbury
	Town of Tiverton
	Town of Voluntown
	Town of Wareham
	Town of Warren
	Town of Warwick
	Town of West Greenwich
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport
Non-governmental organizations or groups	Alliance to Protect Nantucket Sound
	Balfour Beatty Communities
	Block Island Historical Society
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	Gay Head Lighthouse Advisory Committee
	Martha's Vineyard Commission
	Montauk Historical Society
	Newport Historical Society
	Newport Restoration Foundation
	Preservation Massachusetts
	Rhode Island Historical Society
	Salve Regina University
	Southeast Lighthouse Foundation
	The Preservation Society of Newport County
	Revolution Wind, LLC (lessee)

Table 2. Consulting Parties Participating in Section 106 Consultation

Participants in the Section 106 Process	Participating 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
	Rhode Island Department of Environmental Management
Federal agencies	NPS

Participants in the Section 106 Process	Participating Consulting Parties
	U.S. Army Corps of Engineers, New England District
	U.S. Army Corps of Engineers, New York District
	Office of the Deputy Assistant Secretary of the Navy for Environment (DASN(E))
	Naval Facilities Engineering Systems Command Headquarters–Cultural Resources
	Naval History and Heritage Command – Underwater Archaeology Branch
	U.S. Department of Defense - Office of the Deputy Assistant Secretary of Defense (Environment), Environmental Compliance and Planning
	U.S. Department of Defense - Office of the Assistant Secretary of Defense for Sustainment
	Advisory Council on Historic Preservation
	U.S. Coast Guard -Sector SE New England
	U.S. Coast Guard - Marine Transportation Systems (CG-5PW)
	Bureau of Safety and Environmental Enforcement
	Environmental Protection Agency
	Federal Aviation Administration
Federally recognized Tribal Nations	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 Tribal Nations	Chappaquiddick Tribe of Wampanoag Nation
	Unkechaug Nation
Local governments	City of Newport
	County of Dukes (MA)
	Town of Charlestown
	Town of East Hampton
	Town of Middletown
	Town of Nantucket
	Nantucket Planning & Economic Development Commission
	Town of Narragansett
	Town of North Kingstown
	Town of New Shoreham
Nongovernmental organizations or groups	Balfour Beatty Communities
	Block Island Historical Society
	Gay Head Lighthouse Advisory Committee
	Newport Restoration Foundation
	The Preservation Society of Newport County
	Rhode Island Historical Society
	Salve Regina University

Participants in the Section 106 Process	Participating Consulting Parties
	Southeast Lighthouse Foundation
	Revolution Wind, LLC (lessee)

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

Participants in the Section 106 Process	Participating Consulting Parties
SHPOs and state agencies	Massachusetts Board of Underwater Archaeological Resources
	Massachusetts Commissioner on Indian Affairs
Federal agencies	U.S. Fish and Wildlife Service
	National Oceanic and Atmospheric Administration – Habitat and Ecosystem Services Division
Non-federally recognized Tribal Nations	The Golden Hill Paugussett
	Eastern Pequot Tribal Nation
	Schaghticoke Tribal Nation
Local Government	Cape Cod Commission
	City of Cranston
	City of East Providence
	City of Fall River
	City of New Bedford
	City of Providence
	City of Rehoboth
	City of Taunton
	County of Barnstable (MA)
	County of Bristol (MA)
	County of Plymouth (MA)
	County of Suffolk (NY)
	Town of Acushnet
	Town of Aquinnah
	Town of Barnstable
	Town of Barrington
	Town of Berkley
	Town of Bourne
	Town of Bristol
	Town of Chilmark
	Town of Coventry
	Town of Dartmouth
	Town of Dighton
	Town of East Greenwich
	Town of Edgartown
	Town of Exeter
	Town of Fairhaven
	Town of Falmouth
	Town of Freetown
	Town of Gosnold
	Town of Griswold

Participants in the Section 106 Process	Participating Consulting Parties
	Town of Groton
	Town of Hopkinton
	Town of Jamestown
	Town of Johnston
	Town of Lakeville
	Town of Ledyard
	Town of Little Compton
	Town of Marion
	Town of Mashpee
	Town of Mattapoisett
	Town of Middleborough
	Town of North Stonington
	Town of Oak Bluffs
	Town of Portsmouth
	Town of Richmond
	Town of Rochester
	Town of Sandwich
	Town of Scituate
	Town of Seekonk
	Town of Somerset
	Town of South Kingstown
	Town of Southold
	Town of Stonington
	Town of Swansea
	Town of Tisbury
	Town of Tiverton
	Town of Voluntown
	Town of Wareham
	Town of Warren
	Town of Warwick
	Town of West Greenwich
	Town of West Tisbury
	Town of West Warwick
	Town of Westerly
	Town of Westport
Nongovernmental Organizations or Groups	Alliance to Protect Nantucket Sound
	Bristol Historical and Preservation Society
	East Greenwich Historic Preservation Society
	Martha's Vineyard Commission
	Montauk Historical Society
	Newport Historical Society
	Preservation Massachusetts
	Balfour Beatty Communities

ATTACHMENT 5 – HISTORIC PROPERTY TREATMENT PLAN FOR THE REVOLUTION WIND FARM ANCIENT SUBMERGED LANDFORMS, OUTER CONTINENTAL SHELF, FEDERAL AND RHODE ISLAND WATERS OF RHODE ISLAND SOUND

[Insert ATTACHMENT 5 – TREATMENT PLAN ANCIENT SUBMERGED LANDFORM FEATURES]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Ancient Submerged Landforms
Outer Continental Shelf, Federal and Rhode Island State Waters of Rhode Island Sound

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island State Waters
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Ancient Submerged Landforms, Outer Continental Shelf and Rhode Island State Waters
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
ASLF	Ancient Submerged Landforms
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MARA	Marine Archaeological Resources Assessment
MOA	Memorandum of Agreement
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
OCS	Outer Continental Shelf
RFP	Request for Proposals
ROD	Record of Decision
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
SOI	Secretary of the Interior
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for Ancient Submerged Landforms (ASLF), which are recommended as eligible for listing on the National Register of Historic Places (NRHP) (the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the Marine Archaeological Resources Assessment (MARA), dated July 2021 (SEARCH, 2021) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable (RWEC) Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the *Historic Resources Visual Effects Analysis – Revolution Wind Farm* (EDR, 2021) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions and Historic Significance**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

- **Section 6.0, References**, is a list of works cited in this HPTP.

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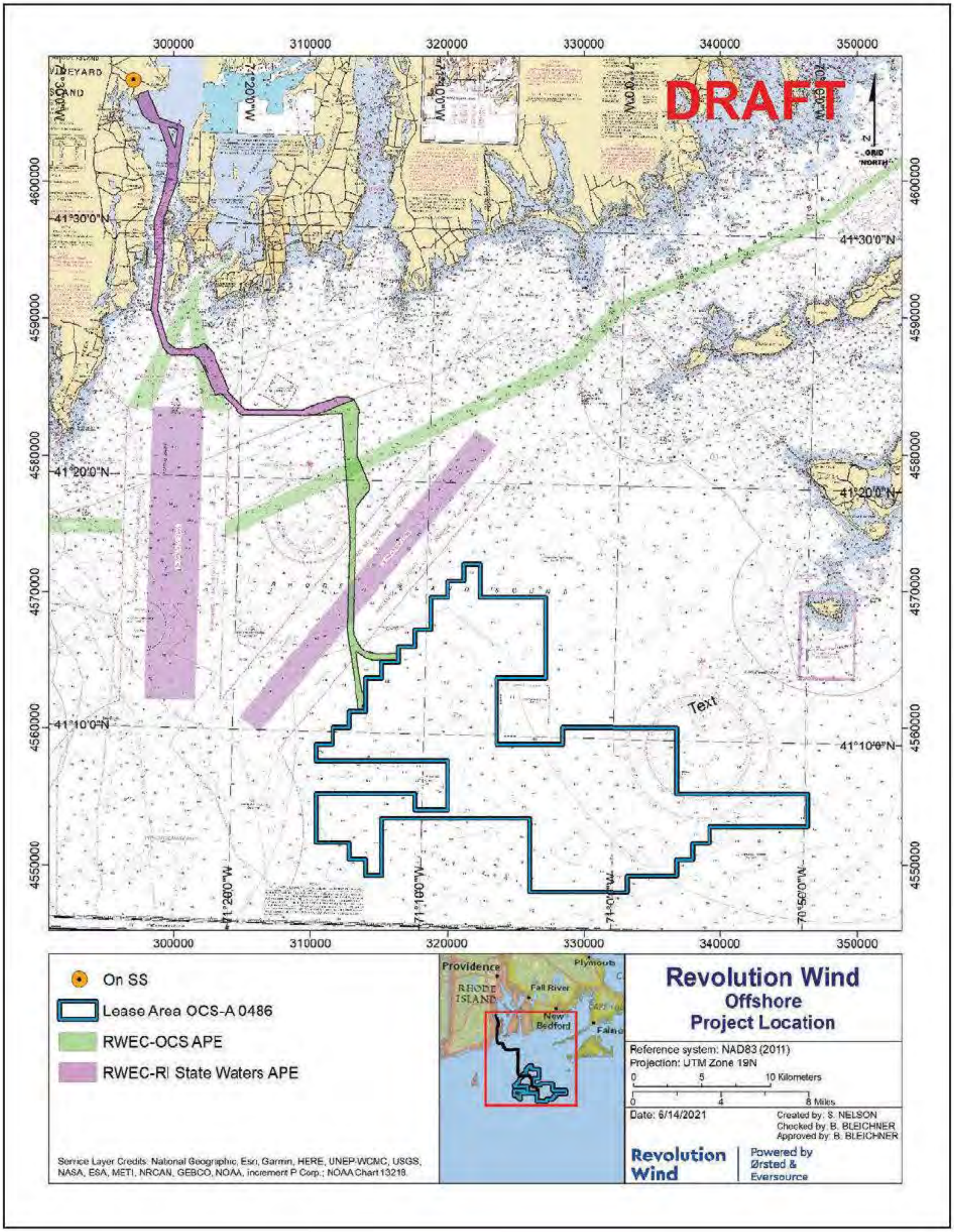
2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the *Marine Archaeological Resource Assessment*. This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state, and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- Mashantucket Pequot Tribal Nation;
- Mohegan Tribe of Indians;
- Narragansett Indian Tribe;
- Shinnecock Indian Nation;
- Wampanoag Tribe of Gay Head (Aquinnah);
- Mashpee Wampanoag Tribe; and
- Historical Chappaquiddick Tribe of the Wampanoag Nation.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS AND HISTORIC SIGNIFICANCE

3.1 Historic Properties

This HPTP involves seven historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Property included in the ASLF HPTP

Name	Municipality	State	Site No. (Agency)	Ownership
Target 21	N/A	RI	N/A	State waters
Target 22	N/A	RI	N/A	State waters
Target 23	N/A	N/A	N/A	Federal waters
Target 24	N/A	N/A	N/A	Federal waters
Target 25	N/A	N/A	N/A	Federal waters
Target 26	N/A	N/A	N/A	Federal waters
Target 28	N/A	N/A	N/A	Federal waters

Figure 3.1-1. Historic Property Location

(map detached:
contains material that meets the criteria for confidentiality under Section 304 of the NHPA)

In Section 3.2, the historic properties are described both physically and within their historic contexts, with a focus on the potential of each to yield information important to prehistory and their potential traditional cultural significance to multiple Native American tribes.

3.2 Ancient Submerged Landform

3.2.1 Physical Description and Existing Conditions

Target 21 [redacted]

Based on a worst-case scenario for export cable alignment relative to the shallow portions of the ASLF, Revolution Wind estimates that roughly 3.6 percent of Target 21 could be disturbed by cable construction activities.

Target 22 [redacted] Based on a worst-case scenario for export cable routing, Revolution Wind estimates that approximately 3.5 percent of Target 22 could be disturbed by cable construction activities. Actual impacts, if any, will likely be of a lower magnitude based on the location of the feature along the outer margins of the survey corridor.

Target 23 [redacted] Based on a worst-case scenario for export cable routing, Revolution Wind estimates that approximately 1.9 percent of Target 23 could be disturbed by cable construction activities. Actual impacts, if any, will likely be of a lower magnitude based on the location of the feature along the outer margins of the survey corridor.

Target 24 [redacted] arget 24 can likely be avoided; however Revolution Wind assumed a worst-case scenario for IAC alignment and estimates that up to 9.1 percent of the shallow portions the ASLF could be impacted by cable construction activities.

Target 25 [redacted]

Two WTGs are located within the boundaries of Target 25 and complete avoidance of the ASLF may not be feasible. Shallow deposits that could be disturbed by IAC construction are limited to the southeastern periphery of the landform. In a worst theoretical case scenario, up to 2.7 percent of Target 25 could be affected by IAC and WTG construction activity.

Target 26 [redacted] No WTGs are planned within the feature limits and no IAC alignments intersect the shallow sections of ASLF. Avoidance of Target 26 is likely feasible. Based on a worst theoretical case scenario for IAC routing, Revolution Wind estimates up to 2.7 percent of Target 26 could be affected by Project construction activities.

Target 28 [redacted] As currently designed, WTG foundations will not be sited within Target-28 and nearly the entire feature falls below the anticipated maximum vertical extent of impact (i.e. 4.6 m [15 ft]) associated with installation of the IACs. Preservation of potentially intact alluvial deposits that could be disturbed by IAC construction are limited to the extreme eastern and southwestern margins of the feature. Avoidance of Target 28 is likely feasible.

3.2.2 Historic Context

Based on radiocarbon data collected for the MARA analyses and detailed reconstructions of the paleolandscapes within the APE, the identified ASLF included in this treatment plan are associated with terminal Pleistocene era incisions of the former Glacial Lake Rhode Island basin following drainage of the former pro-glacial lake by approximately 15,500 cal. B.P. Drainage of the lake occurred when a sediment dam between Block Island and Cox Ledge was breached, causing catastrophic flooding on the portions of the Outer Continental Shelf (OCS) southwest of Revolution Wind and extensive erosion of the former lake bottom in the area of the RWF and southern sections of the RWEC (Cacciopolli, 2015). [redacted]

[redacted] No direct evidence of human use of these locations has been recovered, but the settings of each are consistent with terrestrial locations used by indigenous peoples in the northeastern United States after 13,000 cal. B.P. [redacted] Current models for Paleoindian settlement and subsistence patterns indicate people living in the region between approximately 13,000 and 11,000 years ago were highly mobile. Reported Paleoindian site locations occur in a wide range of environmental [redacted].

It is important to note that very little is known about potential coastal adaptations during this time period. The submerge continental shelf contains the vast majority of coastal habitats that would have been available to people living in the region more than 12,000 years ago. Practical and technological challenges have limited the range of surveys that might yield direct evidence of now-submerged coastal sites. Where terminal Pleistocene or very early Holocene coastal sites have been identified elsewhere in North America, those sites have yielded different types of stone tools than typically associated with Paleoindian sites in the Northeast. As such, it is plausible that archaeological expressions of Pleistocene coastal occupations in the New England region may look quite different than their counterparts in the interior sections (now on the mainlands).

[redacted] As shared with Revolution Wind by tribal representatives, several of the consulting tribes' traditions hold that their people have always been here. They did not migrate from ancient Asia or Europe or anywhere else. Their origins are rooted here, in the Northeast, and at the interface between the seas and lands. Important events in tribal histories occurred on the OCS and preserved elements of the ancient landscapes with which their ancestors and culture heroes interacted are important.

3.2.3 NRHP Criteria

Based on prior BOEM consultations for the South Fork Wind Farm and Vineyard Wind 1 Wind Farm undertakings and Revolution Wind's assessments, the identified ASLF are potentially eligible for listing in the National Register of Historic Places under Criterion D for their potential to yield important information [redacted]. Each ASLF may also be eligible for listing under Criterion A [redacted]

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. The conceptual mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior (SOI) Qualifications Standards for Archeology and/or History (62 FR 33708) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project. NRHP-qualifying characteristics of each historic property that would be affected. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review by consulting parties.

4.1 Target 21, Target 22, Target 23, Target 24, Target 25, Target 26 and Target 28

4.1.1 Preconstruction Geoarchaeology

4.1.1.1 Purpose and Intended Outcome

This mitigation measure will consist of the collection vibracores within the affected portions of each ASLF prior to Project construction. The collected cores, the locations which will be selected in consultation with Native American tribes, will be analyzed in collaboration with the tribes to provide a more detailed understanding of ancient terrestrial landscapes along the RWEC and within the RWF [redacted]. Data acquired from this effort is expected to refine the age estimates for each stable landform, the timing and character of ecological transitions evidenced in the MARA research and provide an additional opportunity to recover evidence of ancient indigenous use of each ASLF.

This measure will provide for a more detailed analysis of the stratigraphy, chronology, and evolving ecological conditions at each ancient landform. Two separate reports on the analyses and interpretations will be developed. The first will be focused on content of specific interest the consulting tribes, including a broad approach to integrating available data collected from other recent archaeological research and surveys on the Atlantic OCS. The specific content and formatting of this report will be refined in consultation with the tribes to align the work product with intended intra- and inter-tribal audiences. The second report will be geared primarily toward technical, Tribal/State Historic Preservation Officer and agency audiences.

4.1.1.2 Scope of Work

The scope of work will consist of the following:

- Collaborative review of existing geophysical and geotechnical data with Native American tribes
- Selection of coring locations in consultation with tribes;
- Collection of two to three vibracores within each affected ASLF with a sampling focus on areas that will be disturbed by Project construction activities;
- Written verification to BOEM that the samples collected are sufficient for the planned analyses and consistent with the agreed scope of work;
- Collaborative laboratory analyses at a laboratory located in Rhode Island or Massachusetts;
- Screening of recovered sediments for debitage or microdebitage associated with indigenous land uses;

- Third-party laboratory analyses, including micro- and macro-faunal analyses, micro- and macro-botanical analyses, radiocarbon dating of organic subsamples, and chemical analyses for potential indirect evidence of indigenous occupations;
- Temporary curation of archival core sections
- Draft reports for review by participating parties;
- Final reporting; and
- Public or professional presentations summarizing the results of the investigations, developed with the consent of the consulting tribes.

4.1.1.3 Methodology

Revolution Wind will conduct the Preconstruction Geoarchaeology in consultation with the participating parties. The research, analyses, and interpretations are intended to be a collaborative effort with the consulting tribes. The research will be conducted in collaboration with the consulting Native American tribes, who will be invited by Revolution Wind to series of working sessions to:

- Review existing data;
- Develop specific research questions addressing the tribes' interests in the ASLF;
- Select candidate coring locations;
- Split, document, and sample recovered vibracores in the laboratory;
- Review analytic results and preliminary interpretations; and
- Review draft reporting.

Vibracores placed within the affected sections of each ASLF will extend a maximum depth of approximately 20 feet (6 meters) below the sea floor. The cores will be cut on the survey vessel into approximately 1-meter-long sections and sealed to minimize the risk of environmental contamination. The core segments will be logged on the survey vessel and a chain of custody will be maintained to ensure all samples are accounted for and that all samples are transferred to the laboratory for geoarchaeological analyses. Once the core segments are transferred to the Qualified Marine Archaeologist, Revolution Wind will invite tribal representatives to participate in the splitting, documentation, and subsampling of each core. Each core segment will be split longitudinally into working and archival halves. Subsamples collected from working halves for specific third-party analyses will be packaged in a manner appropriate to the specific analysis for which they are intended. Archival halves will be sealed and stored horizontally on shelves or racks in a climate-controlled facility for at least one year following completion of laboratory analyses. Revolution Wind will prioritize reasonable access to archival core segments by Consulting Parties when selecting the storage facility. All samples collected from the working halves will be submitted to third party laboratories within approximately 6 months of core transfer to the Qualified Marine Archaeologist facilities.

Revolution Wind will prepare a presentation of the preliminary results and interpretations for discussion with the Tribes (see work session schedule above). Revolution Wind will consider the Tribes' comments and suggestions when preparing the draft reports and will seek to resolve any disagreements among the parties through supplemental consultations prior to preparing the draft reports.

Revolution Wind will submit the draft reports to the participating parties for review and comment. Revolution Wind will consider all comments received when developing the final reports. Final digital copies of the completed reports will be provided to all participating parties. Hard copies of the final reports will be submitted to the State Historic Preservation Officers, tribes or other parties upon request.

Following the one-year retention period, Revolution Wind will offer transfer of the archival core segments to the Consulting Tribes, SHPOs and related state agencies, and regional research institutions with an interest in and capacity to conduct further analyses. Revolution Wind currently anticipates research institutions with potential interests/capacities to include the University of Rhode Island, University of Connecticut, and Eastern Connecticut State University. Revolution Wind will notify the Consulting Parties of its intent to transfer archival core segments to any party at least 45 days prior to initiating such transfer and will consider any comments provided by Consulting Parties before proceeding. If no external parties agree to accept the archival core segments, Revolution Wind will water-screen the retained segments to identify and collect potential physical evidence of ancient Native American activity at the ASLFs. In such circumstances, Revolution Wind will prepare a technical memorandum summarizing the results of the archival core segment processing and analyses and submit that memorandum to the Consulting Parties.

4.1.1.4 Standards

The Preconstruction Geoarchaeology effort will be conducted in accordance with BOEM's *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585* (May 2020). The qualified professional archaeologists leading the research will meet the SOI professional qualification standards for archeology (62 FR 33708) and BOEM's standards for Qualified Marine Archaeologists.

4.1.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Draft Tribal Audience Report;
- Draft Technical Report;
- Final Tribal Audience Report;
- Final Technical Report; and
- Draft Public or Professional Presentations.

4.1.1.6 Funds and Accounting

Revolution Wind will be responsible for funding and implementation of this mitigation measure.

4.1.2 Open-Source GIS and Story Maps

4.1.2.1 Purpose and Intended Outcome

This mitigation measure will consist of the compilation and transfer of relevant geophysical, geotechnical, and geoarchaeological datasets pertaining to the ASLF to a non-proprietary GIS system for use by Native

American tribes. The datasets will include subbottom (seismic) data used to characterize the seabed and ASLF features, the location of all geotechnical/geoarchaeological samples collected, and the vertical and horizontal extents of the affected features or sub-features within each ASLF. The GIS will be, to the extent feasible and practicable, compatible with GIS datasets compiled for other OCS projects to assist in the tribes' on-going research and stewardship efforts. Story Maps or equivalent digital media presentations will be prepared to integrate and present the complex technical data compiled during the MARA and mitigation investigations in a manner best-suited for inter- and intra-tribal audiences. Story Map content would be developed in close consultation and collaboration with the consulting Native American tribes.

Incorporation of Revolution Wind datasets into a broader GIS framework will allow the tribes to better understand and protect preserved elements of the ancient submerged landscapes of traditional cultural significance. The intent of this measure is to enhance the Tribes understanding of existing conditions for a range of ASLFs located in the northeastern Atlantic OCS. This knowledge would allow for more effective Government to Government consultations regarding similar features that may be affected by future federal undertakings. The value of the GIS will increase as additional datasets are acquired and incorporated. Access to the GIS will support each Tribes' capacity to pursue their own research or intra-tribal educational programs related to the OCS and traditional cultural uses [redacted] Integrated GIS that can accommodate datasets collected from other OCS development projects and surveys would allow for comparisons to areas south of the maximum glacial limits on the OCS to provide a more comprehensive view of the ancient landscapes within the region. Revolution Wind will provide reasonable compensation to tribal representative working with Revolution Wind on implementation of this measure. Story Maps created within the GIS will provide a flexible approach to incorporating media from a variety of sources, including geospatial data, interviews with traditional knowledge-holders, photographs, audio recordings, and archival cartography for a compelling interpretive experience. Story Maps can be tailored for specific tribal audiences and uses and would be developed in consultation with the consulting tribes.

4.1.2.2 Scope of Work

The scope of work will consist of the following:

- Consultation with the Tribes to determine the appropriate open-source GIS platform;
- Review of candidate datasets and attributes for inclusion in the GIS;
- Data integration;
- Development of custom reports or queries to assist in future research or tribal maintenance of the GIS;
- Work Sessions with Tribes to develop Story Map content;
- Training session with Tribes to review GIS functionality;
- Review of Draft Story Maps with Tribes;
- Delivery of GIS to Tribes; and
- Delivery of Final Story Maps.

4.1.2.3 Methodology

Revolution Wind will develop the GIS in consultation with the Participating Parties. At least one work session will be scheduled to refine specific functionality of interest to the Tribes. That session will be conducted after the preliminary data analyses for the Preconstruction Geoarchaeology effort has been completed. This will allow for a more focused walk-through of the data and options for organizing and integrating different datasets. Revolution Wind will request from the Tribes details on any existing open-source GIS systems currently in use by each Tribe to minimize any issues with data integration or interoperability. Once the work session has been conducted Revolution Wind will proceed with development of the GIS, taking into account the Tribes' comments and suggestions. The draft GIS system will be shared with the Tribes in a training session that presents the functions of the GIS and familiarizes the tribal representatives with the interfaces, data organization, and any custom features developed to enhance useability. Revolution Wind will consider any feedback from the Tribes on the draft GIS before proceeding with finalizing the system design and implementation. Revolution Wind will provide the GIS to the Tribes by physical storage media or as a secure digital file transfer, as appropriate to each Tribes IT infrastructure and preference. Revolution Wind does not intend to be responsible for the upkeep of the GIS database.

Story Map content will be developed with the consulting Tribes through one or more scheduled work sessions. Potential options for content intended for youth audiences, tribal governments, and/or general tribal membership will be discussed to refine the conceptual framework and develop draft Story Maps for review by the Tribes. Revolution Wind will consider all comments and feedback provided by the Tribes when preparing the final Story Maps.

4.1.2.4 Standards

The GIS developed under this measure will be free to use and free to modify by the tribes. To the extent feasible, all data will be provided in formats that allow for interoperability with other GIS platforms that the tribes may use. All datasets incorporated in the GIS will comply with Federal Geographic Data Committee data and metadata standards.

4.1.2.5 Documentation

Revolution Wind will provide draft descriptions and documentation of the GIS for review by the Participating Parties and will provide a description of the draft Story Maps to the consulting Tribes following the initial working sessions.

The following documentation is to be provided for review by Participating Parties:

- Draft Description of the GIS with appropriate schema, data organization, and custom reports/queries;
- Draft Story Map descriptions with details on content, formatting, and intended audiences; and
- Final Technical Description of the GIS with schema, data organization, and custom reports/queries.

4.1.2.6 Funds and Accounting

Revolution Wind will be responsible for funding and implementation of this mitigation measure.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA Substitution schedule for Revolution Wind Farm, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between);[2]
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between);
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties;
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS;
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between);
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between);
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between);
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between);
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between);
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between);
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS);
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS;
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM;

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Marine Archaeological Resources, January 24, 2022; and
- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Marine Archaeological Resources, February 9, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA Substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 6 – HISTORIC PROPERTY TREATMENT PLAN FOR THE REVOLUTION WIND FARM, THE [redacted] #1 AND #2 SITES, TOWN OF NORTH KINGSTOWN, WASHINGTON COUNTY, RHODE ISLAND

[Insert ATTACHMENT 6 – TREATMENT PLAN TERRESTRIAL HISTORIC PROPERTIES THAT WILL BE ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review and Comment by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The [redacted] #1 and #2 Sites, Town of North Kingstown, Washington County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Adverse Physical Effect Finding for:	The [redacted] #1 and #2 Sites,
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
cmbgs	centimeters below ground surface
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MOA	Memorandum of Agreement
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
QDC	Quonset Development Corporation
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
RI SHPO	Rhode Island State Historic Preservation Officer
ROD	Record of Decision
RWF	Revolution Wind Farm
STP	shovel test pit
THPO	Tribal Historic Preservation Officer
USCG	United States Coast Guard
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for two archaeological historic properties, the [redacted] #1 and #2 Sites (the historic properties) provides background data, resource-specific information, and detailed steps that will be implemented to carry out the mitigation actions identified by the applicant in the *Terrestrial Archaeological Resources Assessment and Site Identification Survey, Revolution Wind Farm Project, Onshore Facilities* (TARA) dated August 2021 (PAL, 2021) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind, LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for these historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.

[1] The timeline is subject to change and is based on current available information

- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the *Historic Resources Visual Effects Analysis – Revolution Wind Farm* (EDR, 2021) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions and Historic Significance**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Onshore Facilities Regional Location

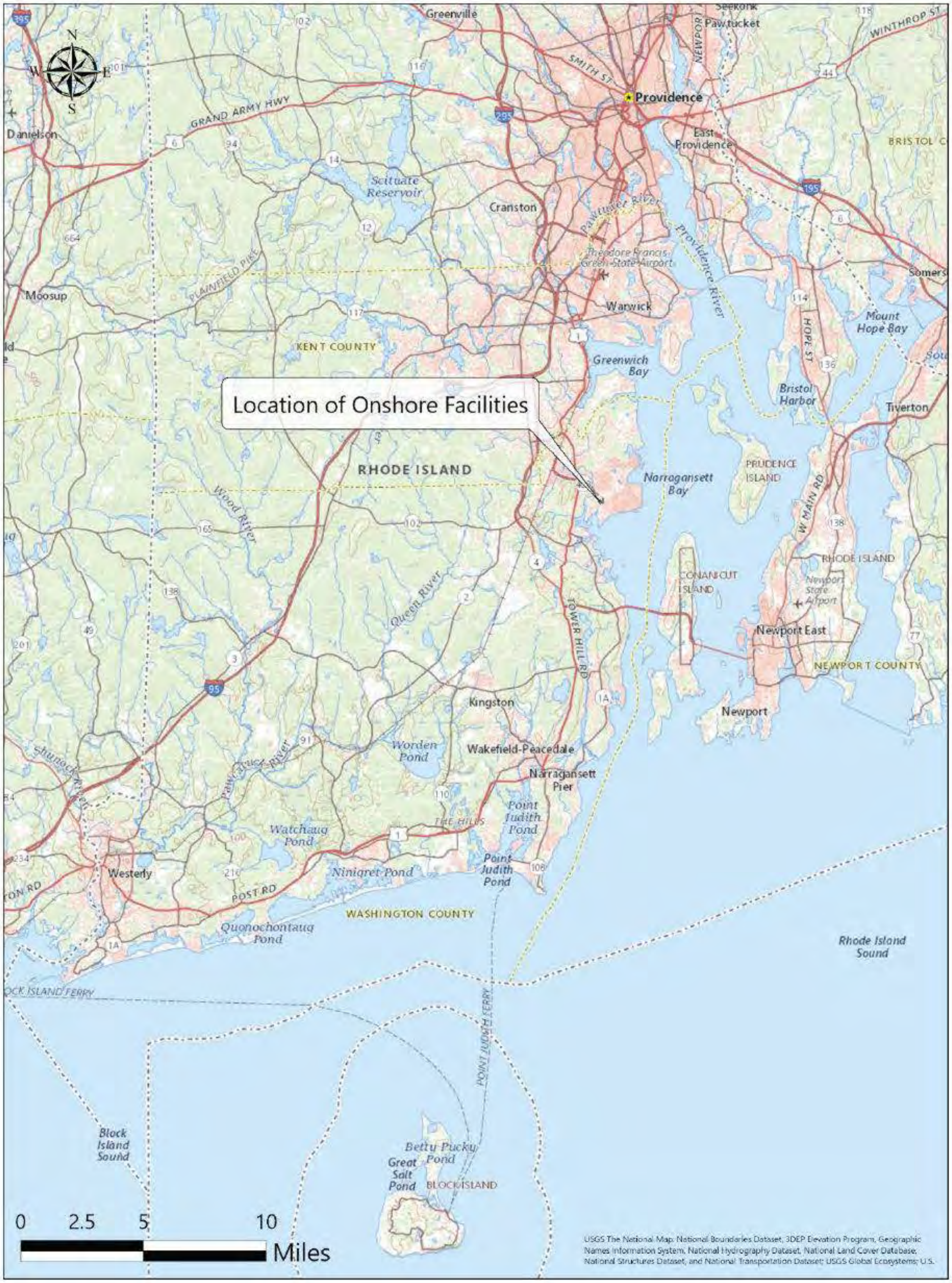
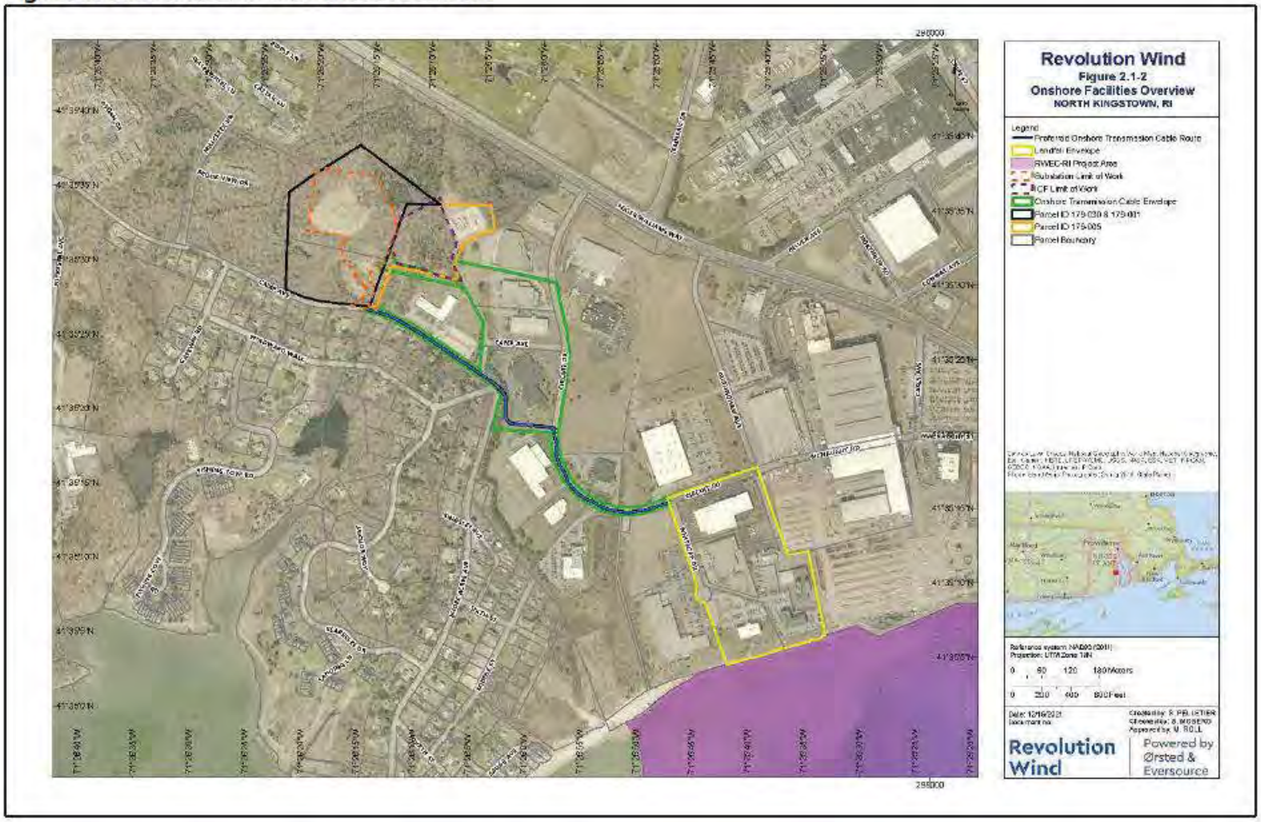


Figure 2.1-2. Onshore Facilities Overview



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act

This HPTP was developed in accordance with the TARA and COP and reflects consultations conducted by BOEM with multiple consulting parties, including the Rhode Island State Historic Preservation Officer (RI SHPO), the Narragansett Indian Tribe, Wampanoag Tribe of Gay Head/Aquinnah, Mashpee Wampanoag, Shinnecock Indian Nation and Mashantucket Pequot Historic Preservation Offices (THPOs). The regulations at 36 CFR § 800.8 provide for use of the National Environmental Policy Act (NEPA) process to fulfill a Federal agency's National Historic Preservation Act (NHPA) Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of a Record of Decision (ROD) and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the National Historic Preservation Act.

The measures to avoid and minimize adverse effects to identified historic properties are described in the *Terrestrial Archaeological Resources Assessment and Site Identification Survey.*

This HPTP addresses the mitigation requirements identified by BOEM to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect consultations among consulting parties to refine a conceptual mitigation framework proposed by Revolution Wind. That framework identified the following measures as appropriate means of resolving adverse effects to the [redacted] #1 and #2 Sites:

a. Data recovery investigations to document and recovery critical information regarding [redacted] the affected sites.

    i. All excavations would be conducted under a permit issued by the Rhode Island Historical Preservation & Heritage Commission.

    ii. Excavations are intended to extend over approximately 20% of the affected section of each site.

    iii. The research design and specific research questions to be addressed through field research and laboratory analyses will be developed in consultation with the consulting Native American Tribes.

    iv. Representatives from the consulting Native American Tribes will be invited to monitor the field investigations and participate in the interpretation of data collected.

b. Technical reports for peer review and dissemination of data at professional conferences/publications.

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its Record of Decision (ROD) and with applicable state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- RI SHPO;
- The Narragansett Indian Tribe THPO;
- The Wampanoag Tribe of Gay Head/Aquinnah THPO;
- The Mashpee Wampanoag Tribe THPO;
- The Mashantucket Pequot Tribal Nation THPO; and
- The Shinnecock Indian Nation THPO.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

This HPTP provides details and specifications for mitigation measures to resolve the adverse effects within the APE for the [redacted] #1 and #2 Sites.

3.0 EXISTING CONDITIONS AND HISTORIC SIGNIFICANCE

3.1 Historic Properties

The HPTP involves two historic properties, as identified in 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Resources included in the HPTP

Name	Municipality	State	Site No.	Property Designation	Ownership
The [redacted] #1 Site	North Kingstown	RI		Recommended NRHP-eligible	[redacted]
The [redacted] #2 Site	North Kingstown	RI		Recommended NRHP-eligible	[redacted]

Figure 3.1-1. [redacted] #1 and #2 Site Locations

(detached:
contains material that meets the criteria for confidentiality under Section 304 of the NHPA)

In Section 3.22 and 3.33, each historic property is individually considered, described both physically and historically. Information on each historic property, relevant historic context, and potential NRHP eligibility is summarized from the *Terrestrial Archaeological Resources Assessment and Site Identification Survey* (TARA; PAL, 2021) prepared in support of the Undertaking's COP submittal to BOEM.

3.2 The [redacted] #1 Site

3.2.1 Physical Description and Existing Conditions

[redacted]

Soils within the [redacted] #1 Site were documented as mostly intact/undisturbed by 19 archaeological shovel test pits (STPs) conducted in June and July 2021 as part of PAL's archaeological survey. In profile, the soils appeared as an organic layer (A_o) overlying a silty sand A horizon. The A horizon was underlain by medium-coarse sand B1 and B2 horizons, overlying an oxidized, coarse sand C horizon. [redacted]

[redacted]

Table 3.2-1. [redacted] Cultural Materials by Stratum, the [redacted] #1 Site

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.2.2 Historic Context

[redacted]

[redacted]

[redacted]

[redacted]

The [redacted] nineteenth- and twentieth-century history of the vicinity of the [redacted] #1 Site is marked by little to no development of the area until rapid transformation of the landscape began during construction of World War II-era military facilities. [redacted] Portions of the area [redacted] were used by the Navy as a general landfill from approximately 1949 to 1953 and again up to 1970. Earth moving activity [redacted] is suggested by bare soil exposure in aerial photography from 1960 and 1970. [redacted] Remediation activities at the former landfill/dump between 1997 and 1998 removed several hundred tons of tires, asphalt, concrete, scrap metal and wood debris, and contaminated soils (VHB, 2019).

3.2.3 NRHP Criteria

[redacted]

[redacted] In the TARA (PAL, 2021), PAL recommended the [redacted] #1 Site as eligible for listing in the NRHP under Criterion A and D.

3.3 The [redacted] #2 Site

3.3.1 Physical Description and Existing Conditions

[redacted]

Soils within the [redacted] #2 Site were documented as intact/undisturbed by nine STPs conducted in June and July, 2021 as part of PAL's archaeological survey. In profile, the soils appeared as an organic layer (Ao) overlying a silty sand A horizon. The A horizon was underlain by a silty fine-medium sand B1 horizon, which was in turn underlain by a silty medium-coarse sand B2 horizon. The B horizons were overlying a medium-coarse sand and gravel C horizon.

[redacted]

Table 3.3-1. [redacted] **Cultural Materials by Stratum, the** [redacted] **#2 Site**

[redacted]

[redacted]

3.3.2 Historic Context

[redacted]

[redacted]

[redacted]

3.3.3 NRHP Criteria

[redacted] In the TARA (PAL, 2021), PAL recommended the Creek Swamp #2 Site as eligible for listing in the NRHP under Criterion A and D.

4.0 MITIGATION MEASURES

Revolution Wind recognizes the significance of the [redacted] #1 and #2 Sites and is committed to avoiding or minimizing impacts to these sites to the extent feasible. This HPTP addresses the mitigation requirements identified by BOEM to resolve the remaining adverse effects. The mitigation measures for the [redacted] #1 and #2 Sites (detailed below) reflect consultations among consulting parties to refine a conceptual mitigation framework proposed by Revolution Wind. BOEM and Revolution Wind have identified steps to implement these measures in consultation with Participating Parties, led by individuals who meet the qualifications specified in the Secretary of the Interior's Qualifications Standards for Archaeology (36 CFR 61) and have demonstrated experience in the interpretation of Precontact Period archaeological sites in the Northeast region.

4.1 The [redacted] #1 Site & [redacted] #2 Site

4.1.1 Data Recovery Investigations

4.1.1.1 Purpose and Intended Outcome

This HPTP proposes to complete Phase III data recovery investigations within the affected sections of the sites to document and recover critical information [redacted]. The intended outcome is to provide funding to a Secretary of the Interior's Qualifications Standards for Archaeology (36 CFR 61) qualified consultant to conduct a data recovery investigation within the affected sections of the historic properties.

4.1.1.2 Scope of Work

The scope of work will consist of the following:

- The preparation of a Phase III Work Plan for submission and review by the Rhode Island State Historic Preservation Officer (RI SHPO), BOEM and THPOs that specifies the scope of the proposed Phase III investigation;
- Field investigation of approximately 20% of the affected sections of both historic properties, including a mix of STPs and 1x1-meter excavation units (EUs) to document the stratigraphic integrity of the site, [redacted];
- Feature documentation and excavation; and
- Artifact recovery, processing, and analysis.

4.1.1.3 Methodology

The research design and specific research questions to be addressed through field research and laboratory analyses will be developed in consultation with the RI SHPO and the Participating Parties. Representatives from the consulting Native American Tribes will be invited to monitor the field investigations and participate in the interpretation of data collected. Excavations are anticipated to include up to 20 percent of the affected sections of the historic properties in order to provide a representative sample of cultural materials and to support detailed analyses.

4.1.1.4 Standards

The project will comply with the following standards:

- Rhode Island Historical Preservation & Heritage Commission's (RIHPC) *Standards for Archaeological Survey* (the *Standards*; RIHPC, 1982); and
- Rhode Island Historical Preservation & Heritage Commission's (RIHPHC) Performance Standards and Guidelines for Archaeology in Rhode Island (the Guidelines, 2021).

4.1.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Phase III Work Plan;
- Draft Phase III Archaeological Data Recovery Report; and
- Final Phase III Archaeological Data Recovery Report.

4.1.1.6 Reporting

The results of the Phase III data recovery investigations will be presented in a Phase III illustrated report prepared in accordance with the *Standards* (RIHPHC, 1982). The report will include the results of the Phase III field investigations, artifact analyses, appropriate maps, photographs, and illustrations, and conclusion regarding significance. It is anticipated that the Phase III report will include the following sections:

1. Introduction: The report will describe the purpose and goals of the investigation and describe the proposed development/construction within the historic properties.
2. Project Background: The report will include a summary of the TARA (PAL, 2021), as well as a summary of correspondence with involved state and federal agencies and Participating Parties.
3. Research Design/Research Questions: The Phase III report will include the research design and specific research questions to be addressed by data recovery and analysis at each site.
4. Field Investigations: The Phase III report will include a summary of the methods and results of field investigations. This will include:
    - one or more artifact density maps,
    - representative stratigraphic profiles for test units
    - stratigraphic profiles and plan views of all investigated potential features
5. Analyses: The report will include a complete artifact inventory, as well as a synthesis and interpretation of the artifact assemblages recovered, and features documented during the Phase I investigation described in the TARA and the proposed Phase III investigations.
6. Conclusions: The report will offer additional preservation and management recommendations and the need (if any) for additional archaeological investigations.

An electronic copy of the Phase III report will be submitted to the RI SHPO, BOEM, and THPOs for review and comment. Revolution Wind will provide two bound copies of the final report to the RI SHPO reflecting the consideration of all consulting party comments and recommendations.

4.1.1.7 Funds and Accounting

Revolution Wind will be responsible for funding the mitigation measures described herein.

5.0 IMPLEMENTATION

5.1 Timeline

Mitigation measures within this HPTP are to be implemented within one year of its finalization, unless a different timeline is agreed upon by Participating Parties and accepted by BOEM. Revolution Wind Farm and Revolution Wind Export Cable construction activities that do not adversely affect historic properties may proceed prior to completion of the HPTPs.

This section of the HPTP identifies which mitigation measures must be implemented prior to the commencement of construction activities that will adversely affect the specific historic property (or properties) addressed by this HPTP and which measures can be implemented during or after Project construction.

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).

[2] The timeline is subject to change and is based on current available information.

- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106 of the NHPA. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

Code of Federal Regulations (CFR). 2021a. 36 CFR 800 – Protection of Historic Properties [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-VIII/part-800. Accessed December 21, 2021.

CFR. 2021b. 36 CFR 61.4(e)(1) – Procedures for State, Tribal, and Local Government Historic Preservation Programs [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-61#p-61.4(e)(1). Accessed December 21, 2021.

CFR. 2021c. 36 CFR 65.2(c)(2) – National Historic Landmarks Program – Effects of Designation [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-65#p-65.2(c)(2). Accessed December 21, 2021.

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Cole, W.R. 1889. *History of Washington and Kent Counties, Rhode Island.* W.W. Preston & Co., New York, NY.

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Juli, H., and K. McBride. 1984. The Early and Middle Woodland Periods of Connecticut Prehistory: Focus on the Lower Connecticut River Valley. *Bulletin of the Archaeological Society of Connecticut* 47:89–98.

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Revolution Wind, LLC (Revolution Wind). 2021. *Construction and Operations Plan for the Revolution Wind Farm and Revolution Wind Export Cable Project.* Available at https://www.boem.gov/renewable-energy/state-activities/revolution-wind-farm-construction-and-operations-plan-april-2021. Accessed January 12, 2022.

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VHB. 2019. *Phase I Environmental Site Assessment - Revolution Wind Proposed Onshore Cable Route and Interconnection Facility: Whitecape Drive, Circuit Drive and Camp Avenue, North Kingstown, Rhode Island.* Prepared for Ørsted North America, Inc. Providence, Rhode Island.

ATTACHMENT 7 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE [redacted] TRADITIONAL CULTURAL PROPERTY [redacted], MASSACHUSETTS & ATLANTIC OUTER CONTINENTAL SHELF

[Insert ATTACHMENT 7 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan for the Revolution Wind Farm

The [redacted] Traditional Cultural Property [redacted] Massachusetts & Atlantic Outer Continental Shelf

Submitted to:

BOEM
Bureau of Ocean Energy Management

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind | Powered by Ørsted & Eversource

Revolution Wind, LLC
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The [redacted] Traditional Cultural Property (TCP)
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
DEIS	Draft Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
ROD	Record of Decision
RWF	Revolution Wind Farm
SOI	Secretary of the Interior

TCP	Traditional Cultural Property
USCG	United States Coast Guard
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the [redacted] Traditional Cultural Property (the historic property), which was determined eligible for listing in the National Register of Historic Places by the Bureau of Ocean Energy Management in 2021, provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

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[1] The timeline is subject to change and is based on current available information.

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- **Section 1.0, Introduction**, outlines the content of this HPTP.

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- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location

[redacted]

2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following party:

- [redacted].

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and depicted on Figure 3.1-1.

Table 3.1-1. Historic Property included in the HPTP

Name	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
The [redacted] TCP	[redacted]	MA	N/A	Multiple	TCP

Figure 3.1-1. Historic Property Location

[redacted]

In Section 3.3 the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

3.3 The [redacted] TCP

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.3.1 Historic Context

[redacted]

[redacted]

[redacted]

[redacted]

3.3.2 NRHP Criteria and the Maritime Visual Setting

BOEM determined the [redacted] TCP is potentially eligible for listing in the National Register of Historic Places under Criterion A [redacted]

The maritime setting of the TCP is integral to its historical and cultural significance. [redacted]

4.0 MITIGATION MEASURES

Mitigation measures at these historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior (SOI) Qualifications Standards for Archeology, History, Architectural History and/or Architecture (62 FR 33708) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 GIS Database of Contributing Resources to the TCP

4.1.1 Purpose and Intended Outcome

Stewardship of the [redacted] TCP is of critical importance [redacted] his HPTP proposes the development of a non-proprietary spatial database of contributing resources and associated physical features to assist in prioritizing preservation efforts and ensure that accurate information is available to support local, state, and federal consideration of TCP impacts in future permitting processes.

A GIS database incorporating the results of on-going documentation of the TCP will be developed and include information on existing conditions at each contributing resource and/or significant element of the TCP district. The GIS will include simple data collection and update interfaces [redacted] to maintain the database and associated records pertaining to the TCP. The GIS will allow for overlays of other publicly available that may assist in identifying sites and places at-risk due to coastal erosion, storm surge, habitat degradation, or other climate change related threats.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Request for Proposals (RFP)[2];
- Proposals by qualified consultants in response to the RFP;
- Preliminary platform, schema, proposed interfaces, and database structures with associated narrative descriptions that accommodate the following mitigation measure (Section 4.2) for review by the Participating Parties;
- Final development and deployment plan for the GIS; and

---

2 [redacted] the RFP for measures described in Sections 4.1 and 4.2 may be combined, provided the scoping is appropriate to encompass the separate deliverable.

- Development and delivery of the GIS with associated datasets.

Final deliverables produced by the consultant will incorporate further comments and any additional information provided by the participating parties.

4.1.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input from the Participating Parties on the criteria for selection and priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.1.4 Standards

Documentation will be prepared by professionals meeting the qualifications specified in the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61). The GIS will be developed by professionals with demonstrated experience in the creation and organization of spatial databases of cultural resources and the relevant and specific attributes necessary for recordation and management. The GIS development will be overseen by a qualified Geographic Information Systems Professional.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft deliverables; and
- Final deliverables.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Development of Interpretative Materials

4.2.1 Purpose and Intended Outcome

Development of the TCP GIS database (see Section 4.1) will allow for incorporation of other digital media pertaining to the physical and cultural elements of the historic property in a manner that enhances intra-tribal and extra-tribal appreciation. GIS story maps or comparable presentations could include relevant archival data, oral histories, news stories, video footage, and public domain datasets [redacted]

The intended outcome of this measure is to support the [redacted] efforts to integrate existing information from disparate sources in a compelling, flexible interpretative format [redacted]. Story maps and comparable presentations would allow [redacted] educational opportunities [redacted], share important information about the TC[redacted], and tell [redacted] stories in a format that enhances [redacted] understanding and supports effective decision-making for future preservation efforts.

4.2.2 Scope of Work

The scope of work will consist of the following:

- RFPs[3];
- Proposals by qualified consultants in response to the RFP;
- Community charette(s) to select topics to be addressed in story maps or other interpretive exhibits;
- Draft story maps for review and comment by participating parties; and
- Final story maps.

4.2.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input from the Participating Parties on the criteria for selection and priorities for the consultant team's qualifications and experience.

Revolution Wind will host a meeting with the Participating Parties to review the draft Story Maps including a walk-through of the user interface, functions and associated media content. Revolution Wind will solicit feedback on the draft work product during the meeting. No more than 30 days following the meeting, Revolution Wind will provide to BOEM and the Participating Parties a summary of the discussions, comments shared, and the steps Revolution Wind will take to incorporate comments in the final work products. Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.2.4 Standards

The GIS media (story maps or other work products) will be developed under the supervision of a qualified Geographic Information Systems Professional. [redacted]

[3] [redacted] the RFP for measures described in Sections 4.1 and 4.2 may be combined, provided the scoping is appropriate to encompass the separate deliverable.

[redacted] the work products will be accessible by parties without access to proprietary software and at no cost to the end-user. [redacted] access to sensitive content may be restricted to limited audiences where disclosure would pose a risk to the contributing resources within the TCP or other historic properties.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft deliverables; and
- Final deliverables.

4.2.6 Funds and Accounting

It is anticipated that funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Climate Adaptation Planning Study

4.3.1 Purpose and Intended Outcome

Multiple elements of the [redacted] TCP are threatened by coastal erosion, habitat degradation, storm impacts, invasive species and other climate change-related risks. [redacted] The Climate Adaptation Planning Study would assess future threats to elements of the TCP included in the integrated GIS database (see Section 4.1) and define a series of options to mitigate those threats.

The intended outcome of this measure is a Climate Adaptation Plan that is focused on the specific resources and characteristics [redacted]. The plan and data compiled during the implementation of the other mitigation measures will assist [redacted] in determining the most appropriate and feasible actions to help preserve the TCP from foreseeable threats. The plan may also foster collaborative efforts among the municipal, state, and private parties to preserve the unique physical and cultural assets [redacted].

4.3.2 Scope of Work

The scope of work will consist of the following:

- RFPs[4];
- Proposals by qualified consultants in response to the RFP;
- Community charette(s) to select priority resources and/or risks;
- Draft plan for review and comment by participating parties; and
- Final plan.

4.3.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input from the Participating Parties on the criteria for selection and priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.3.4 Standards

The Climate Adaptation Planning Study will be conducted by qualified professionals with Global Association of Risk Professionals' Sustainability and Climate Risk certification and/or demonstrated experience in the preparation of climate change risk assessments for municipal, state, or federal governments.

4.3.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft Plan for review and comment by participating parties; and
- Final Plan.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4 [redacted] the RFP for measures described in Sections 4.1 and 4.2 may be combined, provided the scoping is appropriate to encompass the separate deliverable.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA Substitution schedule for Revolution Wind Farm, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).[5]
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[5] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with tribal nations are performed by professionals who have demonstrated professional experience consulting with Native American tribes and descendant communities.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – [redacted] TCP, February 16, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA Substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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CFR. 2021b. 36 CFR 61.4(e)(1) – Procedures for State, Tribal, and Local Government Historic Preservation Programs [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-61#p-61.4(e)(1). Accessed December 21, 2021.

CFR. 2021c. 36 CFR 65.2(c)(2) – National Historic Landmarks Program – Effects of Designation [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-65#p-65.2(c)(2). Accessed December 21, 2021.

CFR. 2022. 40 CFR 1500 – National Environmental Policy Act Implementing Regulations. Available at https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A. Accessed January 7, 2022.

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Federal Register. 2021. FR30068 -Department of the Interior, Bureau of Ocean Energy Management, Docket No.: BOEM-2021-0029. *Notice of Intent to Prepare an Environmental Impact Statement for Revolution Wind LLC's Proposed Wind Energy Facility Offshore Rhode Island; Reopening of Comment Period and Corrections.* Office of the Federal Register, National Archives and Records Administration. Washington, D.C. Available at https://www.govinfo.gov/content/pkg/FR-2021-06-04/pdf/2021-11727.pdf. Accessed February 8, 2022.

[redacted]

Revolution Wind, LLC. 2021. *Construction and Operations Plan for the Revolution Wind Farm and Revolution Wind Export Cable Project.* Available at https://www.boem.gov/renewable-energy/state-activities/revolution-wind-farm-construction-and-operations-plan-april-2021. Accessed January 12, 2022.

[redacted]

ATTACHMENT 8 – THE [redacted] TRADITIONAL CULTURAL PROPERTY [redacted] MASSACHUSETTS & ATLANTIC OUTER CONTINENTAL SHELF

[Insert ATTACHMENT 8 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The [redacted] Traditional Cultural Property

[redacted] Massachusetts & Atlantic Outer Continental Shelf

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
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July 2022

ABSTRACT

Federal Undertaking: Revolution Wind Farm and Revolution Wind Export Cable Project

Location: Outer Continental Shelf and Rhode Island

Federal and State Agencies:
Bureau of Ocean Energy Management
National Park Service
U.S. Army Corps of Engineers
Massachusetts Historical Commission
Rhode Island Historical Preservation & Heritage Commission
New York Historic Preservation Office
Connecticut Historic Preservation Office
Advisory Council on Historic Preservation

Regulatory Process:
National Environmental Policy Act
Section 106 of the National Historic Preservation Act
Section 110(f) of the National Historic Preservation Act

Purpose: This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.

Potential Adverse Visual Effect Finding for: The [redacted] Traditional Cultural Property (TCP), [redacted] Massachusetts and Atlantic Outer Continental Shelf

Submitted By: Revolution Wind, LLC

Date: July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement

FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
ROD	Record of Decision
RWF	Revolution Wind Farm
TCP	Traditional Cultural Property
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the [redacted] Traditional Cultural Property (the historic property), which was determined eligible for listing in the National Register of Historic Places by the Bureau of Ocean Energy Management in 2021, provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location

[redacted]

2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The State of Massachusetts preservation restrictions are outlined in Massachusetts General Law Chapter 184, Sections 31-33. [redacted] Additional information regarding compliance with extant preservation restrictions appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) with Federally recognized Native American Tribes and interested consulting parties to review conceptual mitigation measures for the historic property.

Revolution Wind anticipates these parties, and any subsequently identified parties, will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Property included in the HPTP

Name	Municipality	State	Site No. (Agency)	Ownership
The [redacted] TCP	Multiple	MA	N/A	Multiple

Figure 3.1-1. Historic Property Location

[redacted]

In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

[redacted]

The maritime setting of the TCP is integral to its historical and cultural significance. [redacted]

3.3 The [redacted] TCP

[redacted]

[redacted]

[redacted]

The TCP maintains a high degree of integrity despite alterations through time [redacted]

3.3.1 Historic Context

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.3.2 NRHP Criteria and the Maritime Visual Setting

The [redacted] TCP is eligible for listing in the National Register under the following criteria:

- Criterion A [redacted];
- Criterion B [redacted];
- Criterion C [redacted]; and
- Criterion D for its potential to yield information [redacted]

The maritime setting of the TCP is integral to its historical and cultural significance. [redacted]

4.0 MITIGATION MEASURES

Mitigation measures at these historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior Qualifications Standards for History, Architectural History and/or Architecture (62 FR 33708) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Support [redacted]

4.1.1 Purpose and Intended Outcome

[redacted] The mitigation measure would improve [redacted] virtual interpretative or physical exhibits. The measure would also provide funding [redacted] to enhance [redacted] stewardship of critical cultural resources.

[redacted]

4.1.2 Scope of Work

The scope of work will consist of the following:

- Identification of appropriate printed and/or digital media for interpretative exhibits;
- Archival research on the history, development, and historical/cultural significance [redacted];

- Consultation with Participating Parties;
    - Consultation meetings and discussions [redacted] will be bilateral with Revolution Wind unless otherwise requested and agreed upon by the federally-recognized Native American Tribes.
- Design and production of draft interpretive materials;
- Design and production of final printed and/or digital interpretive materials; and
- Scoping of an Improved Access Assessment in direct consultation [redacted]

Final deliverables produced by the consultant will incorporate further comments and any additional information provided by the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a Request for Proposals (RFP) for consultant services in consultation with the Participating Parties and will seek input from the consulting Tribes on the criteria for selection and the Tribes' priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.1.4 Standards

Documentation will be prepared by professionals meeting the qualifications specified in the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61). Scoping for the Improved Access Assessment will include the advice and guidance of individuals with appropriate professional qualifications for unexploded ordnance surveys and clearance activities if the Aquinnah and Mashpee agree that such efforts are appropriate.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft deliverables; and
- Final deliverables.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Scholarships and Training [redacted]

4.2.1 Purpose and Intended Outcome

[redacted] Development of the lands and seas within and near the TCP will continue to alter the character-defining elements of the historic property. Climate change is also threatening multiple culturally significant habitats and associated plant and animal communities [redacted] The purpose of this measure is to enhance the capacity [redacted] to preserve the critical physical and cultural attributes of the TCP through training and education [redacted]. Revolution Wind would fund scholarships and fees for professional training or certification programs in the fields of Astronomy, Archaeology/Anthropology, Marine Sciences, Aquaculture, Marine Fisheries, Marine Construction, Native American Studies, Ethnohistory, History, Biology, and related fields through this measure. [redacted] recipients of financial support funded through this measure may be required to perform a limited period of service [redacted] related to their field of study or training.

The intended outcome of this measure is to [redacted] protect and preserve the TCP and its constituent elements through education and professional development. Traditional stewardship activities, [redacted] would be enhanced through incorporation of professional and academic training with traditional knowledge.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Development of selection criteria for qualified applicants to receive financial support for educational and training opportunities;
- Development of specific accreditation requirements for educational and training programs to which qualified tribal members may enroll;
- Establishment of the appropriate [redacted] departments to select among applicants to the funding program;
- Development of fiscal control measures and annual reporting standards for all disbursements; and
- Development of a Scholarship Program Proposal for review by Revolution Wind prior to initial disbursements, with proposed administrative costs to compensate [redacted] for administration of the program.

4.2.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input [redacted] on the criteria for selection and the [redacted] priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.2.4 Standards

Documentation will be prepared by professionals with demonstrated experience in education and training program management and fiscal reporting.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Executed contracts between the implementing party and selected consultants; and
- Draft Scholarship Program Proposal; and
- Final Scholarship Program Proposal.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Coastal Resilience and Habitat Restoration

4.3.1 Purpose and Intended Outcome

Climate change poses a significant threat to [redacted] elements of the TCP. Rising seas and water temperatures, expansion of invasive species, trends towards shorter, warmer winters, and the increased frequency and intensity of coastal storms are expected to result in future losses of character defining features and contributing resources to the historic property. This measure will provide funding for planning and implementation of targeted efforts to mitigate such foreseeable losses, support economically sustainable [redacted] practices, and documentation and/or recover of threatened elements of cultural sites associated with the TCP.

The intended outcome of this measure is to identify, and where appropriate, implement projects to preserve, recover, and enhance culturally sensitive species habitat, cultural sites, and to offset the foreseeable impacts of climate change. The structure of this measure is intended to provide for appropriate flexibility [redacted]

[redacted] to respond to changing conditions over the period of funding and accounts for the unpredictability of certain future environmental conditions. The proposed funding would support phased planning and implementation of related activities. [redacted]

4.3.2 Scope of Work

The scope of work will consist of the following:

- Development of selection criteria for qualified planning and implementation activities;
- Development of specific professional qualifications for support of funded activities;
- Designation of the appropriate [redacted] body to select project proposals for funding; and
- Development of fiscal control measures, including conflict of interest provisions, and annual reporting on all funded activities.

4.3.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input [redacted] on the criteria for selection and the [redacted] priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.3.4 Standards

Documentation will be prepared by professionals with demonstrated experience in archaeology, habitat restoration, coastal resilience planning program management 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 MHC regulations (950 CMR 70). This HPTP does not require MHC permitting for activities that would not otherwise require such permitting.

4.3.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft deliverables; and

  Final deliverables.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.4 Archaeological and Cultural Sites Data Compilation

4.4.1 Purpose and Intended Outcome

[redacted] The measure would provide for a systematic update of existing Massachusetts Historical Commission (MHC)-maintained resource inventories for sites associated with the affected TCP. A historic context for the TCP, drawing upon a NRHP-nomination prepared by others, would be developed to integrate newly compiled information and enhance [redacted] stewardship efforts.

The intended outcome of this measure is an updated open-source GIS inventory of archaeological/cultural sites that contribute to the significance of the [redacted] TCP and a companion historic context that assists [redacted] in prioritizing preservation and stewardship efforts. Where feasible, the inventory will include updated information on the existing conditions of contributing resources.

4.4.2 Scope of Work

The scope of work will consist of the following:

- Collection and review of existing [redacted] documentation of contributing resources to the [redacted] TCP;
- Coordination with the parties preparing the NRHP nomination for the TCP to verify resource inventory;
- Field visits and photo-documentation, as feasible, to document existing conditions at contributing archaeological and cultural resources within the TCP;
    - Field visits and documentation will be coordinated with the parties preparing the NRHP nomination to avoid duplicative efforts.
- Development of one or more historic contexts for interpretation of contributing resources in alignment with the draft NRHP nomination;
- Preparation and submittal of revised MHC archaeological site forms or comparable documentation for non-archaeological resources to MHC;
- Preparation of GIS data in an open-source format suitable for incorporation in [redacted] existing GIS infrastructure;
- Submittal of draft historic context(s) and inventory forms to Participating Parties for review and comment; and

- Submittal of final work historic context(s) and MHC inventory forms to participating parties.
    - All submittals to MHC will follow agency guidelines regarding document formatting and print size.

4.4.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input [redacted] on the criteria for selection and [redacted] priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.4.4 Standards

The updated inventory will be prepared by professionals meeting the Secretary of the Interior's professional qualification standards in archeology and/or history (36 CFR 60) and in direct consultation [redacted].

4.4.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft and Final Historic Context(s) and MHC Inventory Forms; and
- Open source GIS database will be for sole use [redacted] or sharing with other Participating Parties [redacted]

4.4.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.5 Maritime Cultural Landscapes & Interconnected Contexts

4.5.1 Purpose and Intended Outcome

[redacted] his measure will draw upon on-going [redacted] studies and documentation of the [redacted] TCPs, interviews with traditional knowledge holders [redacted], and supplemental archival research to document the interconnected components of a broader maritime cultural landscape. [redacted] The intended outcome is a publicly-available and inclusive synthesis of information and knowledge about the maritime cultural landscapes along the shores, coastal islands, and waters of southern New England and Long Island. [redacted]

4.5.2 Scope of Work

The scope of work will consist of the following:

- Collection and review of available documentation regarding [redacted] traditions associated with the coastal and submerged lands and waters of the region;
- Consultations[2] [redacted] to refine the geographic extent of a potential maritime cultural landscape;
- Consultations [redacted] to identify appropriate knowledge-holders with an interest in sharing traditions and beliefs associated with the maritime cultural landscape;
- Consultations with appropriate knowledge-holder to identify appropriate names and terms for significant elements of the cultural landscape;
- Preparation of draft mapping depicting the boundaries and sub-divisions or significant elements of the landscape;
- Interviews with traditional knowledge-holders to collect information regarding traditions and variations on traditions associated with the cultural landscape;
- Creation of GIS data layers depicting the boundaries and names of significant maritime cultural landscape elements;
    - To the extent feasible and practicable, GIS data will be formatted to be compatible with open-source platforms used by the Tribes or employed to share data generated from other offshore wind projects in the region;
- Submittal of a preliminary draft report and mapping synthesizing the information gathered;
- Review of all comments and suggestions provided [redacted] on the preliminary draft report;
- Submittal of a second draft report to Participating Parties for review and comment; and
- Submittal of final report to Participating Parties.

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[2] Consultations under this Scope of Work will be conducted [redacted] unless requested and agreed upon [redacted].

4.5.3 Methodology

Revolution Wind will release a RFP for consultant services in consultation with the Participating Parties and will seek input [redacted] on the criteria for selection and [redacted] priorities for the consultant team's qualifications and experience.

Final deliverables produced by Revolution Wind or their consultant team will incorporate further comments and any additional information provided by the Participating Parties.

4.5.4 Standards

The report will be prepared by professionals meeting the Secretary of the Interior's professional qualification standards in cultural anthropology, archeology, and/or history (36 CFR 60) and in direct consultation [redacted].

4.5.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft and Final reports; and
- Open-source GIS database will be for sole use [redacted] or sharing with other Participating Parties [redacted].
- If mutually agreed [redacted], a publicly-available Open-source GIS will be created for access by other Participating Parties and members of the surrounding communities.

4.5.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA Substitution schedule for Revolution Wind Farm, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.
- BOEM may, at its discretion, assist the implementing party in inter-agency coordination with USFWS and the Navy.

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.2 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by federally recognized Native American Tribes and interested consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with Participating Parties. As of July 2022, this outreach has included the following:

- Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – [redacted] TCP, February 9, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA Substitution schedule for Revolution Wind Farm (see Section 5.5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

Bureau of Ocean Energy Management (BOEM), 2021. Supplement to the Finding of Adverse Effect For the Vineyard Wind 1 Project Construction and Operations Plan, March 9, 2021. Available at: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Supplemental-FoAE.pdf.

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[redacted]

[redacted]

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[redacted]

ATTACHMENT 9 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: SALTER'S POINT, TOWN OF DARTMOUTH, BRISTOL COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 9 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review and Comment by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Salters Point

Town of Dartmouth, Bristol County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Salters Point
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF FIGURES

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ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for Salters Point, which has been determined by the Massachusetts Historical Commission (MHC) to be eligible for listing on the National Register of Historic Places (NRHP) (the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

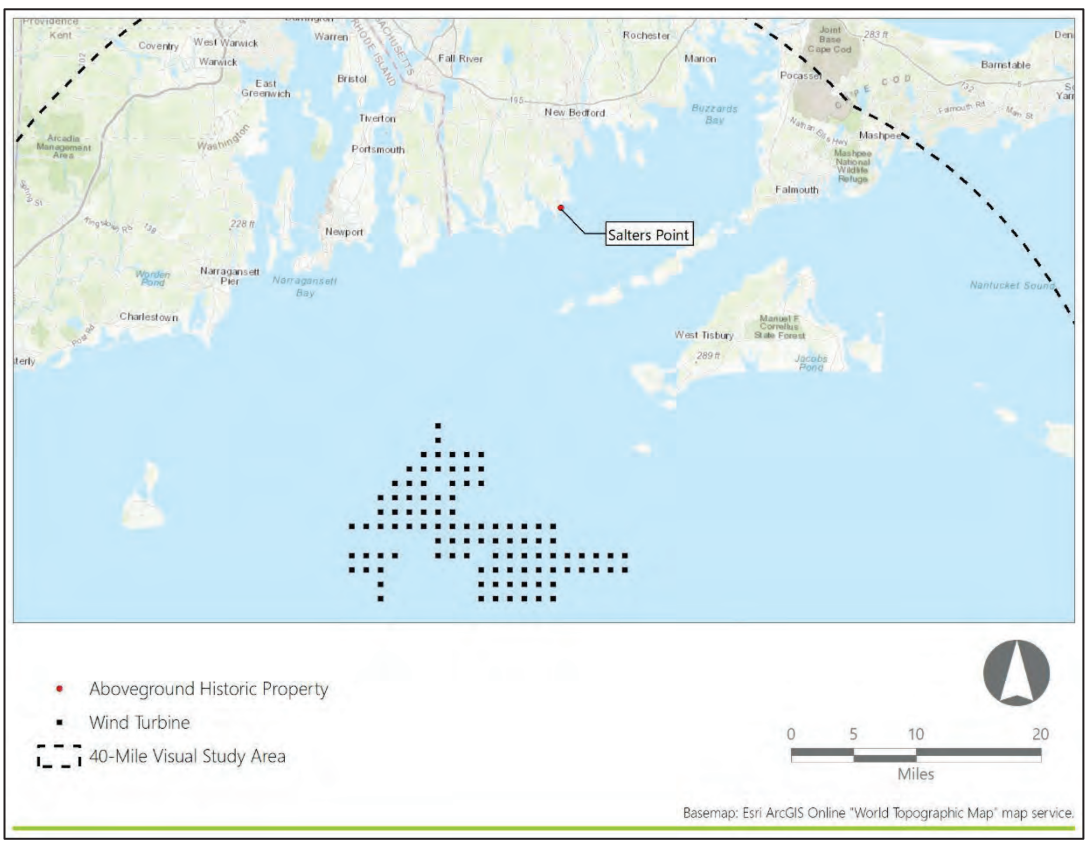
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (Federal Register, 2021). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Dartmouth
- The Massachusetts Historical Commission.[2]

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

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[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

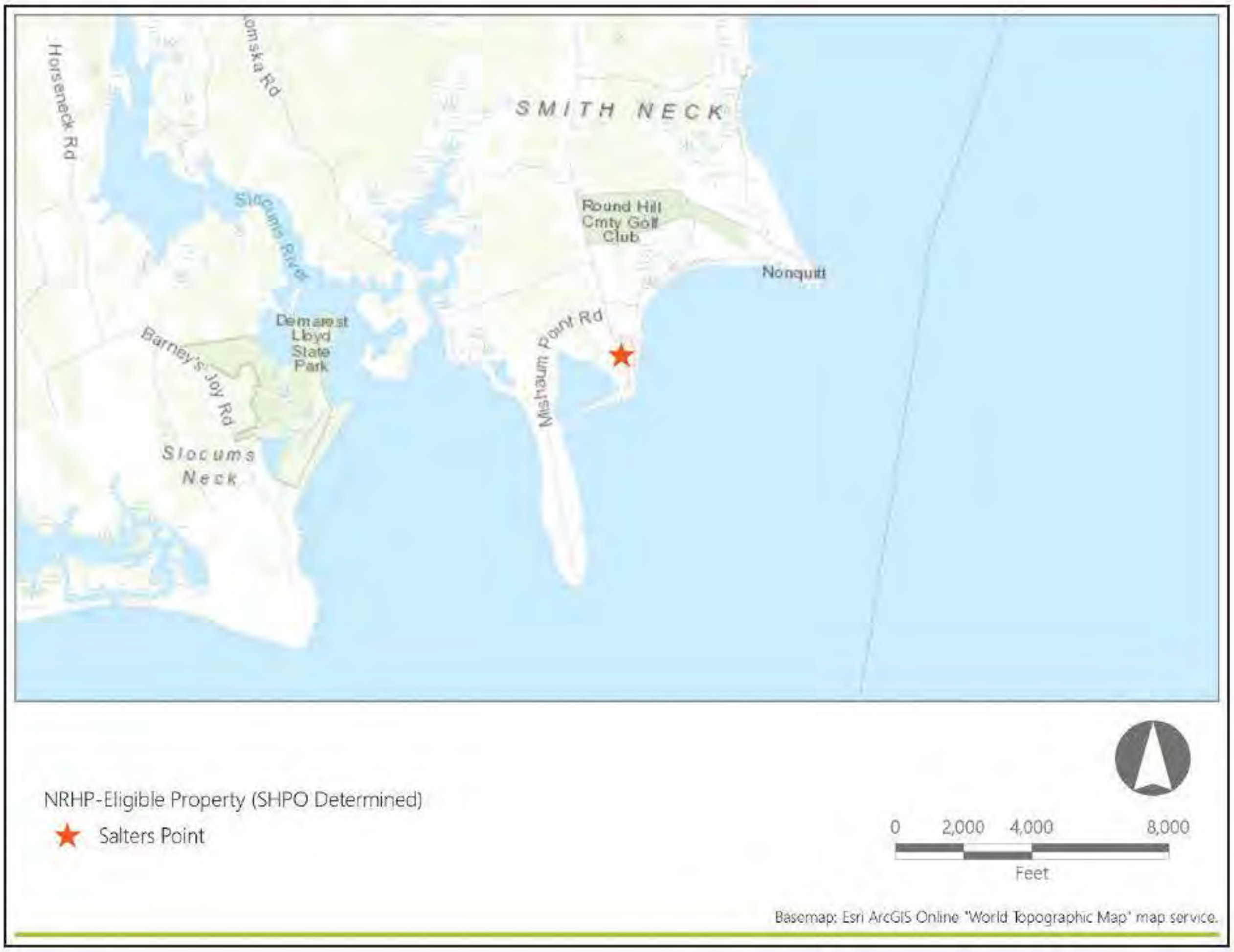
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Property included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Salters Point	NRHP-Eligible (MHC Determined)	Dartmouth	MA	DAR.B (MHC)	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

Salters Point is considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the Estates and Estate Complexes property type. These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 Salters Point

3.3.1 Physical Description and Existing Conditions

Salters Point is located at the southern end of Smith Neck Road and is physically defined by a stone wall with a sign indicating it is private property at the intersection of Smith Neck and Mishaum Point Roads. Within the boundaries of the district are Buzzard's Bay Avenue, Ocean Avenue, Gosnold Avenue, Barn Way, Riley Street and Naushon Avenue. Salters Point, as it currently stands, was developed as a resort community between c. 1890 and c. 1910.

3.3.2 Historic Context

Historically, Salters Point was a farm known as "Southern most farm" or "Salt House Point Farm" (Weinstein, 1983). Two of the properties associated with Benjamin Smith's Salt House Point Farm remain, 108 and 116

Ocean Avenue. In addition, as Dartmouth had a strong salt industry during the eighteenth century, a salt works was located on Salters Point in the early eighteenth century (MHC, 1981).

In the 1890s, a group from New Bedford, Massachusetts purchased 77 acres on Salters Point to develop a summer resort colony. Roads within the point were developed and lots were defined. According to the MHC Form, the developers established rules that the new owners had to follow, including each lot could have only one structure, "indoor earth closets or privies were required and no liquor could be made or sold on the premises." The majority of residences were constructed in the Colonial Revival style. As a resort, Salters Point had a casino, bowling alley, tennis courts, a yacht club, and a nine-hole golf course (Weinstein, 1983).

The Salters Point Inn was constructed in 1900 and had 20 bedrooms. The farmhouse located at 108 Ocean Avenue was used as an annex to the Inn (Melhuish, 2010). The Inn was a gathering place for the residents of Salters Point, many of whom would eat in the dining room regularly. The Inn was demolished in 1946 (Weinstein, 1983).

Nine properties within the boundaries of Salters Point have individual MHC Inventory Forms: the Smith Family Cemetery, 61 Naushon Avenue, the Benjamin Smith/Giles Smith House, the Alvin F. Waite/James T. Smith House at 116 Ocean Avenue, the Alvin F. Waite/James T. Smith House at 124 Ocean Avenue, the Frederick H. Wilks House, the George Bartlett House, the Lydia A. Payne House, and the Salters Point Water Corporation Building. The buildings were constructed between circa 1680 and circa 1900, with the oldest being part of the original farm and the latest built as part of the Salters Point resort.

3.3.3 NRHP Criteria and the Maritime Visual Setting

Salters Point is significant under Criterion A as a designed summer resort colony on the Massachusetts coastline and Criterion C for its Colonial Revival style architecture. Its role as an eighteenth-century farmstead and salt works are also important aspects of the district's significance.

Salters Point The is sited on the eastern side of the Salters Point peninsula with prominent views of eastern Buzzards Bay and the Elizabeth Islands. The district is visually and historically linked to the maritime environment through recreation and aesthetic considerations that contributed to its development. Although some screening of the ocean horizon in the direction of Rhode Island Sound is provided by Mishaum Point to the southwest, open views towards the southern portions of the Project are expected.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Context for Summer Cottage/Resort Development

4.1.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Dartmouth. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;

- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.1.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
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- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Massachusetts Historic Properties, February 10, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 10 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: 744 SCONTICUT NECK ROAD, TOWN OF FAIRHAVEN, BRISTOL COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 10 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review and Comment by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

744 Sconticut Neck Road
Town of Fairhaven, Bristol County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking: Revolution Wind Farm and Revolution Wind Export Cable Project

Location: Outer Continental Shelf and Rhode Island

Federal and
State Agencies:
Bureau of Ocean Energy Management
National Park Service
U.S. Army Corps of Engineers
Massachusetts Historical Commission
Rhode Island Historical Preservation & Heritage Commission
New York Historic Preservation Office
Connecticut Historic Preservation Office
Advisory Council on Historic Preservation

Regulatory Process:
National Environmental Policy Act
Section 106 of the National Historic Preservation Act
Section 110(f) of the National Historic Preservation Act

Purpose: This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.

Potential Adverse Visual
Effect Finding for: 744 Sconticut Neck Road

Submitted By: Revolution Wind, LLC

Date: July 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for 744 Sconticut Neck Road, which has been determined by the Massachusetts Historical Commission (MHC) to be eligible for listing on the National Register of Historic Places (NRHP) (the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
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- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

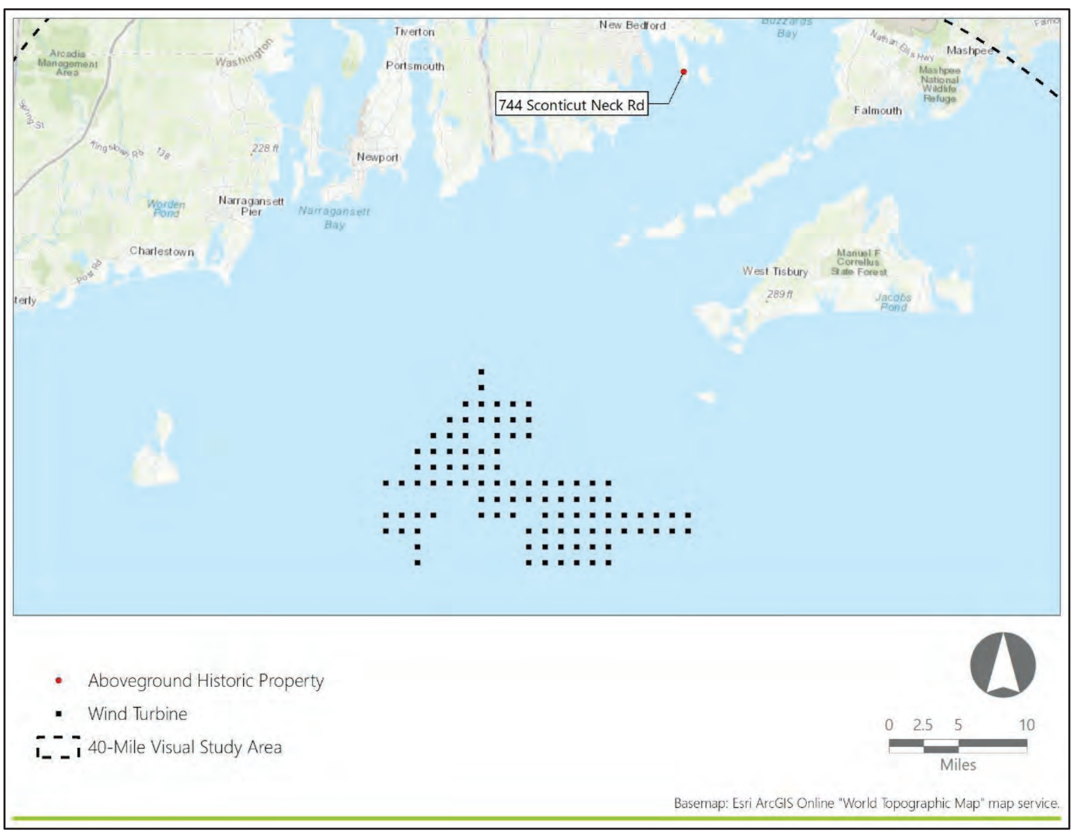
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (Federal Register, 2021). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Fairhaven
- The Massachusetts Historical Commission.[2]

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

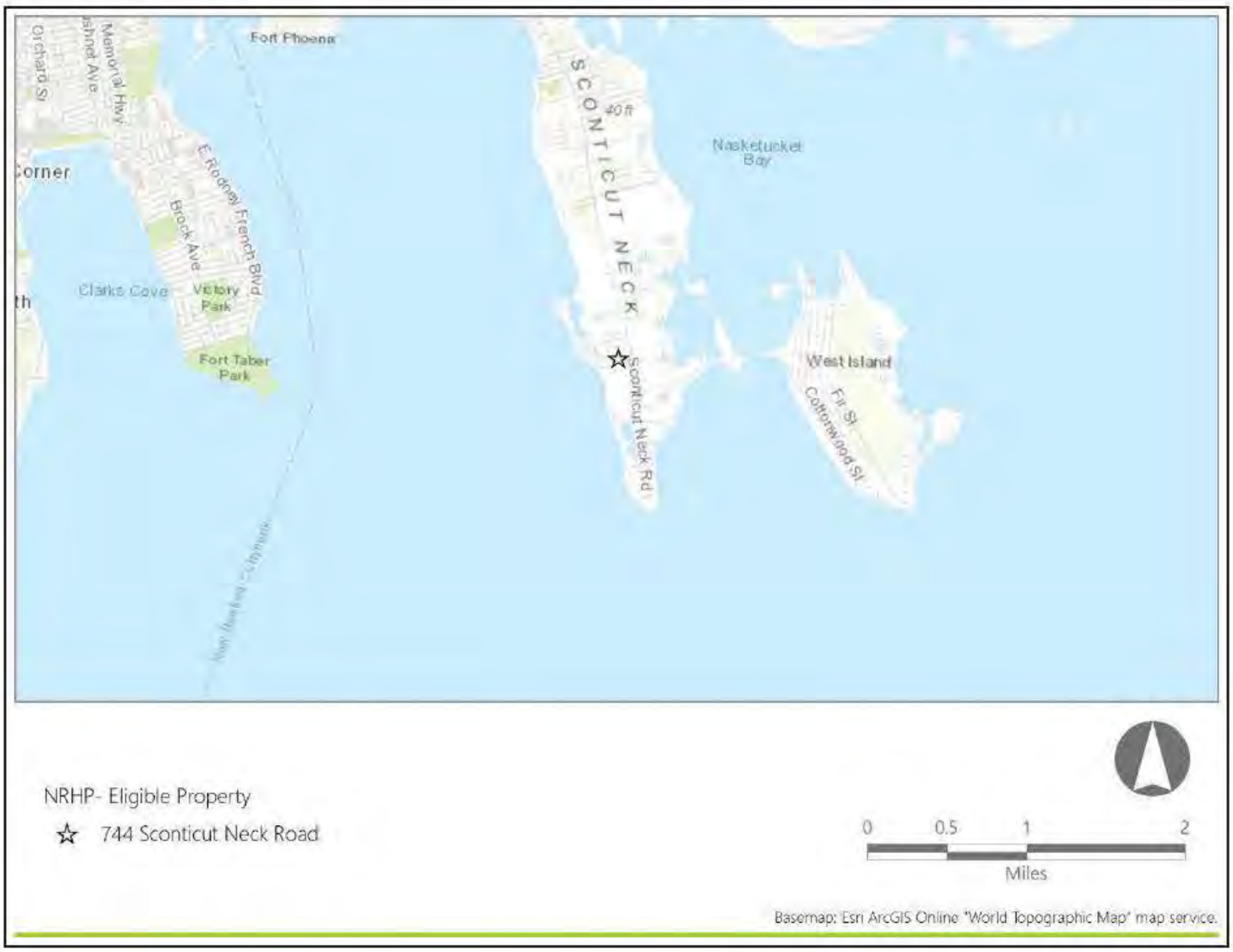
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Property included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
744 Sconticut Neck Road	NRHP-Eligible (MHC Determined)	Fairhaven	MA	FAL.302 (MHC)	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

744 Sconticut Neck Road is considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the Estates and Estate Complexes property type. These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 744 Sconticut Neck Road

3.3.1 Physical Description and Existing Conditions

744 Sconticut Neck Road, also known as 736 Sconticut Neck Road, is located on the west side of Sconticut Road overlooking Buzzards Bay on Sconticut Neck in Fairhaven, Massachusetts. The building is a two-and-a-half story, shingle-clad, stone foundation, four-square colonial revival style residence built circa 1910. A veranda appears to wrap around three sides of the building and three hipped dormers extend from the roof on the eastern, southern and western sides.

Per aerial and topographic map review as well as the Town of Fairhaven Property Records, the property currently has four outbuildings, at least one was constructed circa 1920 (Patriot Properties, 2022). A carriage house/garage is located at the rear of the property can has a hipped dormer, two garage doors, a cupola, and living space. A second carriage house/garage is located behind the house and the main building has a hipped dormer, two garage doors, a cupola, and living space. A one-story addition is located off the western elevation. Two smaller structures are located to the south of the existing pool.

3.3.2 Historic Context

In the mid-to-late 1870s, resort development began along Sconticut Neck due to the town's location as a suburb of New Bedford (MHC, 1981). Sconticut Neck's location between Buzzards Bay and Nasketucket Bay made this formerly sparsely developed area a prime location for summer homes. A review of available historic and topographic maps indicates that the majority of buildings along Sconticut Neck Road were not constructed until the early twentieth century, and there has been relatively little development over the past century, preserving the predominantly rural character.

3.3.3 NRHP Criteria and the Maritime Visual Setting

The property at 744 Sconticut Neck Road appears to meet NRHP Criteria C as an early-twentieth-century residence and outbuildings associated with the history and development of Sconticut Neck. The house is a largely unmodified, representative example of an early-twentieth-century four-square residence with an intact agricultural and maritime context in the region. 744 Sconticut Neck Road is sited on the west side of Sconticut Neck between Buzzards Bay and Nasketucket Bay on a flat, open plot of land with open views towards the western sections of Buzzards Bay and portions of Rhode Island Sound, beyond.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Context for Summer Cottage/Resort Development

4.1.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Fairhaven. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;

- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.1.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
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- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. The proposed mitigation measures were developed by Revolution Wind. As part of the development of this HPTP, Revolution Wind anticipates conducting targeted outreach with the Participating Parties identified in Section 2.3.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

Code of Federal Regulations (CFR). 2021a. 36 CFR 800 – Protection of Historic Properties [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-VIII/part-800. Accessed December 21, 2021.

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ATTACHMENT 11 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE FORT TABER HISTORIC DISTRICT AND THE FORT RODMAN HISTORIC DISTRICT, TOWN OF NEW BEDFORD, BRISTOL COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 11 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Fort Taber Historic District

The Fort Rodman Historic District

City of New Bedford, Bristol County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Fort Taber Historic District and the Fort Rodman Historic District
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
RFP	Request for Proposals
ROD	Record of Decision
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
USCG	United States Coast Guard
WTG	Wind Turbine Generator

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The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
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- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
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- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

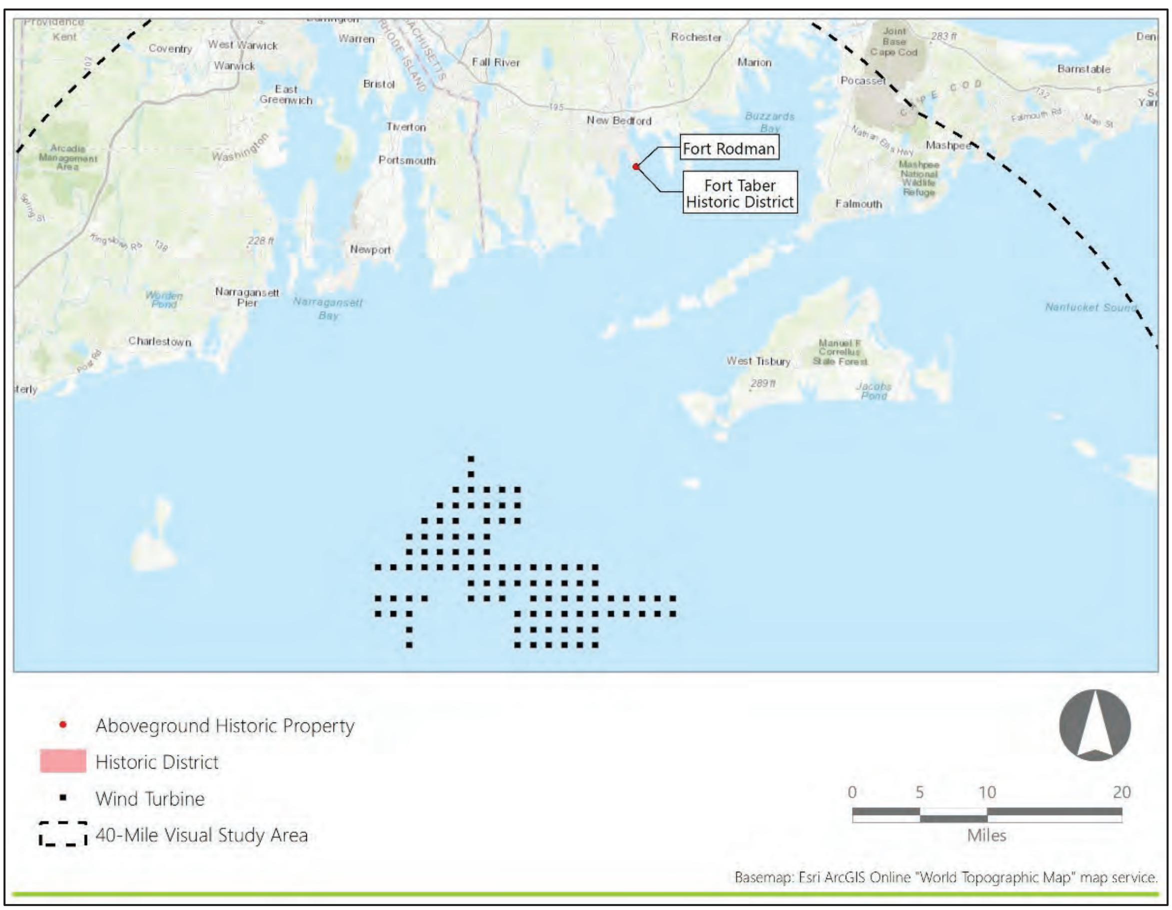
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The City of New Bedford
- The Massachusetts Historical Commission.[2]

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

Revolution Wind anticipates the above-listed party and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

This HPTP involves two historic properties, as identified in Table 3.1-1 and located on Figures 3.1-1 and 3.1.2.

Table 3.11-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Fort Taber Historic District	NRHP-Listed	New Bedford	MA	NBE.C	Public (City of New Bedford)	Maritime Safety and Defense Facilities
Fort Rodman Historic District	NRHP-Eligible (MHC Determined)	New Bedford	MA	NBE.F	Public (City of New Bedford)	

Figure 3.1-1. Historic Properties Location

In Sections 3.3. and 3.4, each historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included in the property type defined in the HRVEA as "Maritime Safety and Defense Facilities" within the PAPE consists entirely of facilities erected by bureaus of the U.S. Department of Defense or their predecessors and share historic associations with coastal defense. These structures vary in their design and construction materials but are unified by their historic functions of rescuing and protecting maritime transportation in the area, or for coastal defense.

Historic military and maritime safety properties along the shoreline will likely be associated with maritime settings. Aesthetic considerations in the siting of such facilities may or may not be expressed in the design of buildings, structures, and landscapes depending on the age and specific functions of the property. Proximity to navigation channels, defensibility, and the presence of existing shipbuilding or repair infrastructure in a broader maritime context may have been significant considerations in the siting of naval facilities. Such factors may not demonstrate a significant association with open ocean viewsheds. The study area includes several significant examples of World War II-era defense structures, including fire control or observation towers designed to monitor specific parts of the maritime environment. Early lifesaving stations were likewise intended to provide for observation of marine waters in the vicinity of know hazards or where storms posed specific risks to sea-going or coastal vessels. Lifesaving stations were also frequent located where rescue boats or other vessels might be safely launched under treacherous conditions. These locations may have included inlets, harbors or coves adjacent to open waters where rescue and recovery efforts would likely be made.

3.3 The Fort Taber Historic District

3.3.1 Physical Description and Existing Conditions

The Fort Taber Historic District is located in the southern portion of New Bedford, Massachusetts on the banks of Buzzards Bay and encompasses approximately 16.5 acres and consists of six contributing structures and five-gun batteries on a 10-acre site. The main structure, Fort Taber, is a seven-sided masonry fort with an interior martial courtyard. The NRHP-listed District is located at the southernmost point of a peninsula (Clark's Point) and is bound to the south and east by Buzzards Bay, to the west by Clark's Cove, and to the north by Fort Rodman and public properties. The main roads located near the district are Rodney French Boulevard and Brock Avenue, which are located to the north of the district. At the time of its designation, the Fort Taber District was solely comprised of military structures. Structures included a fort (Fort Taber/Rodman) and five major gun emplacements, or batteries (Butler, 1973).

Much of the surrounding area is comprised of public properties and includes a park and associated parking lot, a beach, a wharf, a wastewater treatment plant, Fort Taber/Rodman, and structures associated with the University of Massachusetts Dartmouth. The topography within the district is very low (5 to 10 feet above mean sea level) as it is situated on a sea-level plain along Buzzards Bay. The landscape is slightly built up and at a higher elevation to the north of the district, within the wastewater treatment plant. Relatively young deciduous trees and pine trees are sparsely scattered throughout the district and surrounding area. Current uses of the district and surrounding area appear to be associated with recreation and public works.

3.3.2 Historic Context

The original fortifications in the Fort Taber District were constructed during the American Revolution and consisted of a series of earthworks mounted with cannons. Despite a British raid in 1778 demonstrating the vulnerability of the port, no improvements or modifications were made until the late 1850s, prior to the Civil War (Fort Taber/Fort Rodman Historical Association, 2021; Butler, 1973). In September 1857, the federal government purchased the Edward Wing Howland farm on Clark's Point for the project. The fort was constructed of granite and designed by Major Richard Delafield, who was assisted in the construction by future Confederate general Robert E. Lee. However, before the granite fort was completed the Civil War began. To provide some defenses, an earthwork fort was constructed to the west of the granite fort. The temporary earthwork fort, named Fort Taber, was completed in 1861 and mounted with brass and iron cannons (Fort Taber/Fort Rodman Historical Association, 2021; Butler, 1973).

By the spring of 1863, the granite-constructed Fort Taber consisted of a seven-sided structure with a five-sided interior courtyard. It was three stories high with five interior rooms. The third story, however, was never completed, with the unused granite blocks being used for the nearby seawall. Four of the interior rooms were utilized for artillery deployment and ammunition storage, while the fifth was utilized as a barracks (Fort Taber/Fort Rodman Historical Association, 2021; Butler, 1973).

Construction of the fort ceased in 1871 following the Civil War, with the fort remaining vacant until 1892, when the City of New Bedford petitioned the War Department for use of the property. The request was granted, and Fort Taber became Marine Park, albeit for a short time. A few years later, in 1898, with the onset of the Spanish American War, the fort was once again utilized by the War Department, rehabilitated, and renamed Fort Rodman in honor of a Massachusetts soldier killed during the Civil War. From 1898 to 1901, during the Endicott Period (1886-1905), five-gun emplacements were constructed to add to the defenses. These guns included Batteries Barton, Craig, Cross, Gaston, and Walcott, all of which are standing today. All five of the gun emplacements were constructed of a reinforced concrete and faced with earth and had steel and iron hardware (Fort Taber/Fort Rodman Historical Association, 2021; Butler, 1973).

Additional improvements were made throughout the first half of the twentieth century, including the construction of an additional gun emplacement (Battery Milliken). However, by 1947 the federal government declared the fort obsolete as a defense installation. While the fort was not used as an active coastal defensive station, the fort provided an area for Army Reserve training until the end of the Vietnam War. Afterwards, the remains of the original Fort Taber (earthwork fort), its associated batteries, and Fort Taber/Rodman were partially sold to the City of New Bedford for educational and park purposes. During the 1970s, interest in restoration of the fort increased and culminated with the creation of the Fort Taber Society (known as the "Friends of Fort Taber"). Since the 1970s, several improvements occurred to the district and surrounding area including the creation of the Fort Taber Historical Association, Fort Taber Park, and a museum dedicated to Fort Taber's history. Currently, the primary use of the district is as a military museum and park (Fort Taber/Fort Rodman Historical Association, 2021; Butler, 1973).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Fort Taber Historic District was originally listed on the NRHP in 1973 and included Fort Taber/Rodman and the five Endicott Period batteries. According to the NRHP Inventory Nomination Form, the district meets NRHP Criterion C as "representative of American coastal fortifications from the Revolutionary period through the mid-twentieth century. Fort Taber itself is an example of the forts constructed in the northeastern United States during the Civil War and remains in a remarkable state of preservation" (Butler, 1973). The fort was designed by Major Richard Delafield, whose design became the standard for American coastal fortifications from 1861 to 1880. Other architecturally significant components of the fort listed on the NRHP Inventory Form included the "Totten-class" embrasures, believed to be the only example of this class of gunport in the New England region.

The NRHP Inventory Nomination Form also details significant events and people associated with the fort and district, meeting NRHP Criteria A and B. As stated in the previous section, Major Delafield was assisted in the construction of the fort by General Robert E. Lee, who led the Confederate forces during the Civil War. In addition, during the Civil War, New Bedford's "Great Stone Fleet," which assembled at Fort Taber, dealt a severe blow to the Confederacy in 1861 and 1862 with its blockade of the entrances to the Charleston and Savannah Harbors. According to the NRHP Inventory Nomination Form (Butler, 1973), "a planned retaliatory attack by the Confederate *Shenandoah* failed only because the ship could not pass Fort Taber's guns to enter New Bedford Harbor."
The district derives historic significance from its seaside location and maritime visual setting, as the location specifically relied on its coastal setting and maritime view in order to provide defenses.

3.4 The Fort Rodman Historic District

3.4.1 Physical Description and Existing Conditions

The Fort Rodman Historic District is in the southern portion of New Bedford, Massachusetts on the banks of Buzzards Bay and encompasses approximately 47 acres. The district encompasses structures not included within the Fort Taber District, discussed previously. Similarly, thedDistrict is located at the southernmost point of a peninsula (Clark's Point) and is bound to the south and east by Buzzards Bay, to the west by Clark's Cove, and to the north by Fort Rodman and public properties. The main roads located near the historic property are Rodney French Boulevard and Brock Avenue, which are located to the north. At the time of its designation, the Fort Rodman Historic District consisted of 47 properties, and included military structures associated with Fort Taber/Rodman constructed during the twentieth century (Seasholes, 1989).

Much of the surrounding area is comprised of public properties and includes a park and associated parking lot, a beach, a wharf, a wastewater treatment plant, and structures associated with the University of Massachusetts Dartmouth. The majority of the topography is very low (5-10 feet above mean sea level) as the district is situated on a sea-plain along Buzzards Bay. However, the landscape is slightly built up and at a higher elevation to the north, near the wastewater treatment plant. Relatively young deciduous trees and pine trees are sparsely scattered throughout the surrounding area. Current uses of the surrounding area appear to be associated with recreation and public works.

3.4.2 Historic Context

For the purposes of this historic context, the discussion will focus on the history of Fort Taber/Rodman otherwise not discussed in Section 3.3.2. This includes structures not included within the Fort Taber District (i.e., the Endicott-Taft Period buildings, the World War II buildings, and Battery Milliken).

By the end of the nineteenth century, additional batteries were constructed at Fort Taber/Rodman during the Endicott Period (1886-1905). These included Batteries Barton, Craig, Cross, Gaston, and Walcott, which are included within the Fort Taber District. The installation of these batteries necessitated the construction of housing and other structures for the men who manned the guns. By 1901, construction had begun on a number of new buildings, including officer's quarters, non-commissioned officer's quarters, barracks, an administration building, a fire apparatus building, guardhouse, bake house, storehouses, and a hospital. As of the writing of the Architectural Inventory Form in 1989 (Seasholes, 1989), six of these structures were still standing and included one officer's quarter, a non-commissioned officer's quarter, a bake house, two storehouses, and the fire apparatus building.

In 1906, William Howard Taft, then Secretary of War, headed a coastal defense review board and recommended the installation of additional facilities. These facilities included searchlights, power plants, lighting, and fire control systems. As a result, the construction of an additional battery was completed in 1921 (Milliken). From 1917 to 1918, additional construction spurred by World War I occurred at the fort. Twenty-three new structures were constructed and included barracks, mess halls, a tool house, and one shelter for searchlight detail. None of the buildings from the World War I era survived other than a radio shack (Seasholes, 1989).

Following World War I, Charles L. Gibbs, U. S. Congressman for New Bedford, wrote to the Secretary of War requesting that Fort Taber/Rodman be converted into a public park. However, it was determined that Fort Taber/Rodman would remain a military reservation. While the fort was included on a list of surplus bases in 1926 and a proposal was submitted to demolish the granite fort in 1935, the Secretary of War maintained that the reservation "includes one of the most important seacoast defenses in the First Corps Area" and was needed for occupation by a garrison in case of war. The onset of World War II entered Fort Taber/Rodman into a new phase of its history (Seasholes, 1989).

Troops, housed in temporary wood barracks, arrived at Fort Taber/Rodman in 1940. Construction of the 700 series buildings (the first generation of World War II standardized plans) began in late 1940 and was completed in early 1941. The buildings were located northeast of the fort, in an open area surrounded by the Endicott Period buildings. A new street grid was laid out and buildings were arranged on it in company blocks. Each block at Fort Taber/Rodman consisted of three barracks, one mess hall, one company administration (supply) building, and one company day (recreation) room. A total of five blocks were constructed at the fort. As of the Architectural Inventory Form (Seasholes, 1989), none of the blocks were complete. In addition to the company buildings, the World War II structures at the fort included an officers' quarters, recreation building, post exchange, hospital ward, and other support buildings. Major alterations were also made to Battery Milliken in response to the possibility of air attacks. The updates were completed in 1942 (Seasholes, 1989).

After World War II the base was declared surplus and was deactivated. The guns were removed and salvaged. While the fort was not used for active coastal defense, the facility was utilized as a training center for Army Reserves through the end of the Vietnam War. During the 1960s, additional structures were constructed, with some utilized by the Jobs Corp. In 1973, the City of New Bedford acquired all of Fort Taber/Rodman except for the section that was still the Army base. The World War II buildings were then used by various city-run programs. Today, most of the former military reservation is a public park (Seasholes, 1989; Fort Taber/Fort Rodman Historical Association, 2021).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Fort Rodman District is an NRHP-eligible district and appears to meet NRHP Criteria A and C. At the time the historic property was recorded, it included 47 historic resources. According to the Architectural Inventory Form (Seasholes, 1989:8), the "standing structures at Fort Rodman reflect almost every period of coastal fortifications and Army construction from the Civil War through World War II and are thus an important, if *not* unique, set of buildings." In addition, the historic property is an important part of the "development of American coastal fortifications from the Revolutionary period through the mid-twentieth century," thus contributing to the nearby Fort Taber National Register District.

The Endicott Period buildings were considered well preserved and consisted of an unusual collection of frame buildings built according to standardized Army plans. According to the Architectural Inventory Form (Seasholes, 1989), Battery Milliken, constructed in 1921 and updated during World War II, was one of only nine such batteries in New England and one of only three for 12-inch guns. While the World War II buildings were not quite as intact as the Endicott Period structures, they did comprise the largest number of standing structures within the military reservation and contained several significant architectural components. For example, the World War II era buildings had good examples of the 700 series structures and "World War II Temporary" style structures. In addition, several structures were one of only several surviving examples of their types, such as the post exchange. Because the structures were related to the coastal fortifications built at the time, the buildings were considered contributing to the Fort Taber National Register District.

The district, as a whole, derives historic significance from its seaside location and maritime visual setting, as the location specifically relied on its coastal setting in order to provide defenses.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Implementation of Rehabilitation Plans and/or Universal Access

4.1.1 Purpose and Intended Outcome

The purpose of this HPTP is to provide funding for the next phase of the *2013 Architectural/Structural Assessment & Feasibility Study for Universal Access*, which includes a conditions assessment and recommendations for repairs and rehabilitation of the historic properties (Bargmann et al., 2013). The exact scope of work will be determined in consultation with the Participating Parties according to the priorities outlined in the plan. The intended outcome of this HPTP is to provide funding to ensure the long-term preservation of these two historic properties and to enable all visitors to be able to enjoy the properties.

4.1.2 Scope of Work

The scope of work will be determined in consultation with the Participating Parties based on the priorities outlined in the *2013 Architectural/Structural Assessment & Feasibility Study for Universal Access* and previous work completed. Prior to any work commencing, photographic and written documentation of the existing condition will be recorded and distributed to the Participating Parties. Upon completion of the work, as-built documentation, including photographs will be completed and distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work. Existing conditions will be documented and photographed. Drawings and specifications supporting the scope of work will be developed in compliance with applicable standards (see Section 4.1.4) and distributed to the Participating Parties for review and comment. Final plans and specifications will be developed incorporating any comments from the Participating Parties. The project will require the mobilization of a qualified contractor that is experienced in the repair and rehabilitation of historic properties. As-built documentation, including photographs will be developed and distributed to the Participating Parties upon completion of the project.

4.1.4 Standards

The mitigation measure will comply with following standards:

- Town of New Bedford Historical Commission;
- Town of New Bedford Planning and Zoning; and
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68).

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Photographs and documentation of existing conditions;
- Draft plans and specifications;
- Final plans and specifications; and
- As-built documentation and photography, as applicable.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Massachusetts Historic Properties, February 10, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

Bargmann, Hendrie, and Archetype, Inc. 2013. *Fort Taber / Fort Rodman Architectural / Structural Assessment and Feasibility Study for Universal Accessibility*. Prepared for the City of New Bedford, Massachusetts. September 2013. Available at http://s3.amazonaws.com/newbedford-ma/wp-content/uploads/sites/46/20191219215652/Fort-Taber-Fort-Rodman-Assessment-amp-Feasibility-Report_Final-0924131.pdf. Accessed February 23, 2022.

Butler, Gerald W. 1973. National Register of Historic Places Inventory - Nomination Form. Fort Taber District.

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ATTACHMENT 12 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: SEVEN HISTORIC PROPERTIES, THE WESTPORT HARBOR HISTORIC DISTRICT, AND THE WESTPORT POINT HISTORIC DISTRICT, TOWN OF WESTPORT, BRISTOL COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 12 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Seven Historic Properties

Town of Westport, Bristol County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Gooseberry Neck Observation Towers The Gooseneck Causeway The Westport Harbor Historic District The Westport Point Historic District The Westport Point Local Historic District Westport Point Revolutionary War Properties Horseneck Point Lifesaving Station Clam Shack Restaurant
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
ROD	Record of Decision
RWF	Revolution Wind Farm
USACE	United States Army Corps of Engineers
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Gooseberry Neck Observation Towers, which is a Massachusetts Historical Commission (MHC) Historic Inventory Site; the Gooseneck Causeway, which is a MHC Historic Inventory Site; the Westport Harbor Historic District; which is a MHC Historic Inventory Site, the Westport Point Historic District, which has been determined by MHC to be eligible for listing on the National Register of Historic Places (NRHP); Horseneck Point Lifesaving Station, which is a MHC Historic Inventory Site; and Clam Shack Restaurant, which is a MHC Historic Inventory Site, (hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

[1] The timeline is subject to change and is based on current available information.

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and Revolution Wind Farm *Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Significance**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder

engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

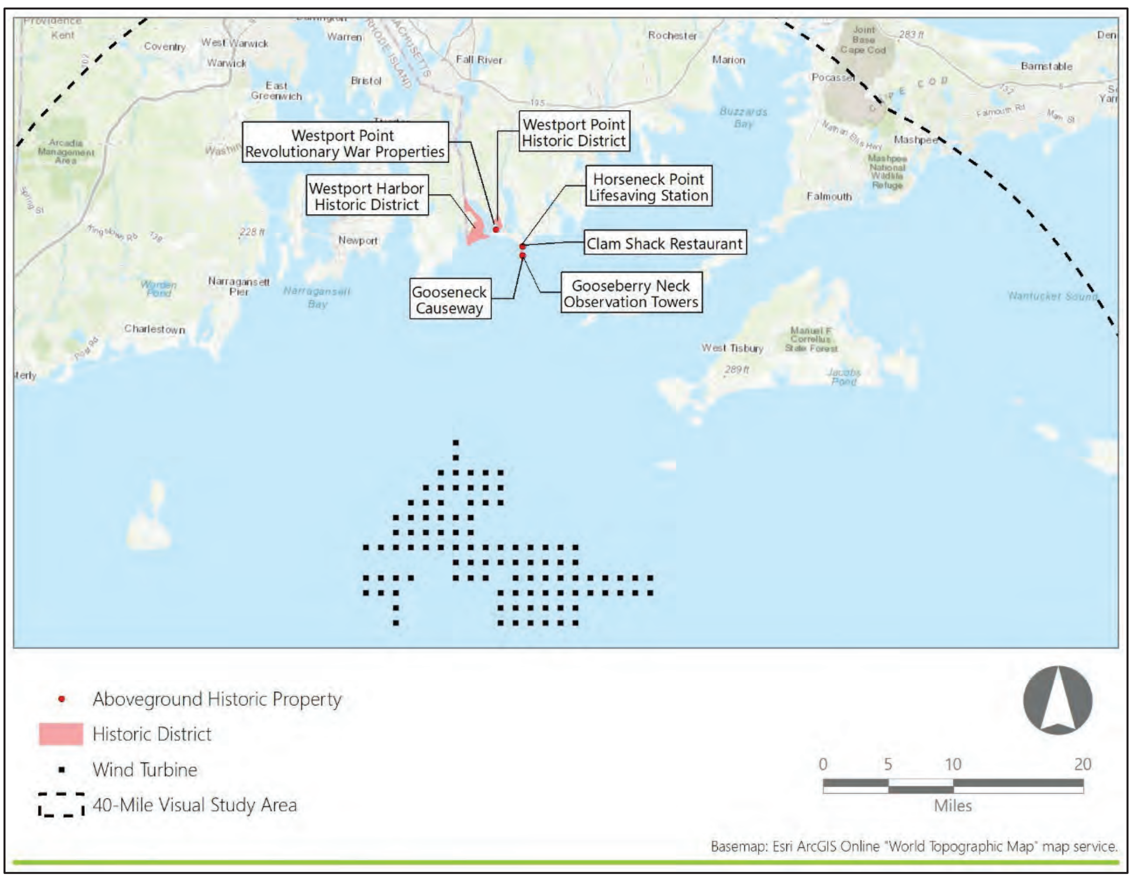
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- The Town of Westport
- The Martha's Vineyard Commission
- The Massachusetts Historical Commission.[2]

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

Revolution Wind anticipates the previously listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

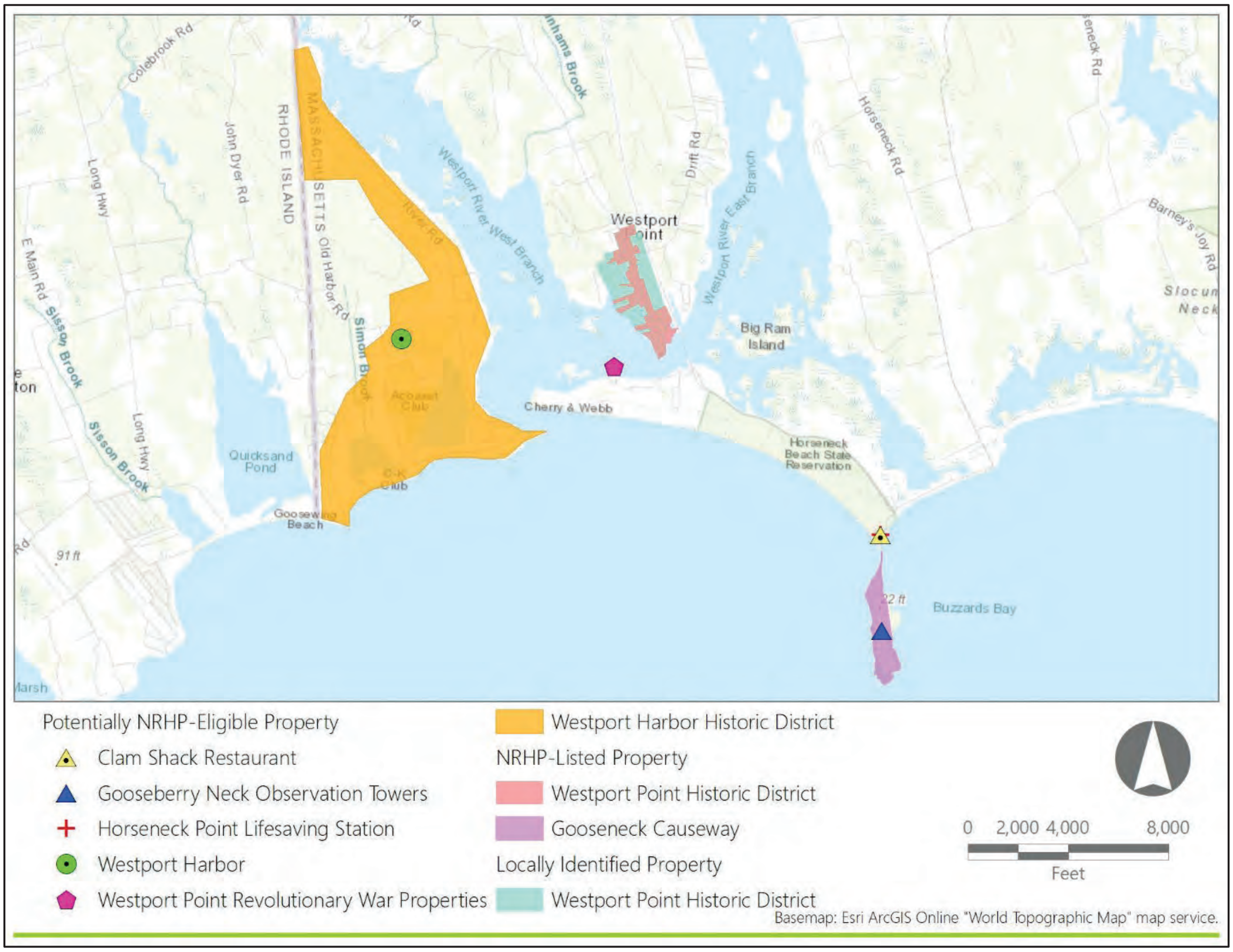
3.1 Historic Properties

This HPTP involves four historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Gooseberry Neck Observation Towers	MHC Historic Inventory Site	Westport	MA	WSP.901 (MHC)	Public	Maritime Safety and Defense Facilities
Gooseneck Causeway	MHC Historic Inventory Site			WSP.902 (MHC)	Public	Historic Buildings and Structures
Westport Harbor Historic District	MHC Historic Inventory Site			WSP.C (MHC)	Private/Public	Historic Buildings and Structures
Westport Point Historic District	NRHP-Eligible (MHC Determined) and Local Historic District			WSP.I (MHC)	Private/Public	Historic Buildings and Structures
Horseneck Point Lifesaving Station	MHC Historic Inventory Site			WSP.732 (MHC)	Public	Maritime Safety and Defense Facilities
Clam Shack Restaurant	MHC Historic Inventory Site			WSP.737 (MHC)	Public	Recreational Properties
Westport Point Revolutionary War Properties	MHC Historic Inventory Site			WSP.M	Private/Public	Historic Battlefields

Figure 3.1-1. Historic Property Locations



In Sections 3.3. through 3.10, each historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA: "Historic Buildings and Structures," "Recreational Properties," "Maritime Safety and Defense Facilities," and "Historic Battlefields". Each property type is defined below as well as the characteristics typical of their maritime setting.

“Historic Buildings and Structures” includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer “cottages” built by wealthy industrialist families that typified the “Estates and Estate Complexes” property type (see below). These above-ground historic properties are typically listed due to each resource’s unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Historic Buildings and Structures not fitting within the previously described types occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road’s alignment. Local roadways along the region’s shorelines often parallel the water’s edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property’s historic setting.

“Recreational Properties” is defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish. These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities.

The same macroeconomic trends that saw the decline of the quintessential New England farm in the mid-19th century are associated with a population shift to cities and rise in affluence for some segments of society. Summer resorts, supported by steamships, rail transportation, and eventually, automobiles were developed in numerous locations in the study area in the late 19th century. These resorts varied between properties intended to serve the rising group of “upper middle income” families living in the region’s cities to estate-like developments serving a more affluent set. Seaside resorts, like many other shoreline recreational, commercial, and residential properties, were often sited to take advantage of aesthetically pleasing ocean or maritime views. Depending on location and the conformation of the local shoreline, such properties may be associated with specific bay or cove viewsheds that include limited areas of the open ocean waters. Recreational activities at resorts frequently included swimming and designated beaches where residents and visitors may have spent considerable time during the summer months. Where these features are still present and express a tangible association with the historic resort property, views from beaches may be as important as views from more formal elements of the designed landscape. Likewise, historic hotels and inns became more common elements of the region's shoreline communities in the late 19th century. Such properties were often sited near harbors, ferry landings, rail stations, and public or private beaches and may be associated with similar historic maritime settings. Views to ocean waters or the more intimate bays and coves of the region may have been an integral part of the visitor's motivation for staying in such establishments. Such considerations can be expressed through the inclusion of building and landscape features clearly intended to afford views of ocean. Older taverns and inns in the study area may be found along the working harbors and ports and were intended to serve the fishing, whaling, and related participants in maritime commerce. The design and location of these properties may not show the same influence of aesthetic considerations but will likely also retain a strong association with the waterfront and maritime environment.

"Maritime Safety and Defense Facilities" consists entirely of facilities erected by bureaus of the U.S. Department of Defense or their predecessors and share historic associations with coastal defense. These structures vary in their design and construction materials but are unified by their historic functions of rescuing and protecting maritime transportation in the area, or for coastal defense.

Historic military and maritime safety properties along the shoreline will likely be associated with maritime settings. Aesthetic considerations in the siting of such facilities may or may not be expressed in the design of buildings, structures, and landscapes depending on the age and specific functions of the property. Proximity to navigation channels, defensibility, and the presence of existing shipbuilding or repair infrastructure in a broader maritime context may have been significant considerations in the siting of naval facilities. Such factors may not demonstrate a significant association with open ocean viewsheds. The study area includes several significant examples of World War II-era defense structures, including fire control or observation towers designed to monitor specific parts of the maritime environment. Early lifesaving stations were likewise intended to provide for observation of marine waters in the vicinity of know hazards or where storms posed specific risks to sea-going or coastal vessels. Lifesaving stations were also frequent located where rescue boats or other vessels might be safely launched under treacherous conditions. These locations may have included inlets, harbors or coves adjacent to open waters where rescue and recovery efforts would likely be made.

Maritime settings for historic piers, marinas, and related marine infrastructure are likely to include strong associations with specific harbors, coves, and bays where related activities were focused, and which exerted a significant influence on the design and construction of the historic infrastructure. The relationship of such local settings to ocean waters and the extent to which open ocean views represent an important element of a specific historic property's setting will vary depending on the orientation of the shoreline and the location of the historic property. The size and location of historic buildings and structures relative to each other and other elements of the surrounding environment may also be important to the overall integrity of historic maritime infrastructure.

Historic seaside villages, ports and other districts in the study area are commonly characterized by dense development and narrow roadways. The maritime setting for such districts is often obvious and may be expressed through the design and orientation of homes, commercial properties and other buildings, parks, docks, piers, and breakwaters. Depending on the specific characteristics of each district, open ocean views may or may not be available from the majority of historic buildings and other areas within a village. Further, marine viewsheds may encompass limited areas due to the complexity of the shoreline and presence of points, necks, or islands that screen views towards the open ocean. Where ocean versus bay views are available but are tangential to the dominant aspects of maritime viewsheds, changes to those distant ocean views may not diminish the integrity of a seaside village or other historic district. Where ocean views are a dominant aspect of the maritime setting, changes to such viewsheds may diminish the integrity of a historic district, even where views are limited to immediate shoreline sections.

Historic battlefields, such as those associated with significant events of the Revolutionary War or War of 1812, may be associated with maritime settings. Whether this is the case would generally be determined by the extent to which the course of events were associated with observation of waterways or whether important actions occurred in marine contexts. Whether viewsheds associated with maritime contexts for these properties are recognizable and can express their associations is a further consideration in assessing whether changes to ocean views may diminish the integrity of historic battlefields.

"Historic Battlefields" within the PAPE consist of typically large landscapes across which the events of historic military actions took place. Within these battlefield landscapes, any number of more focused and specific points of significance may exist, while the collective significance of the events of the battle is broader.

3.3 The Gooseberry Neck Observation Towers

3.3.1 Physical Description and Existing Conditions

The Gooseberry Neck Observation Towers consist of two reinforced concrete observation platforms sited on Gooseberry Neck, an undeveloped promontory separating Rhode Island Sound and Buzzard's Bay. The towers are located approximately 75 feet apart, and reportedly were intended to appear as a lighthouse complex when viewed from the water at a distance. The northwest tower is roughly two stories tall and square in plan, with an unglazed observation opening at midpoint and an infilled or boarded-up observation opening at an upper level. The southeast tower is taller, with several observation levels and window openings along its height as well as a balcony-like feature below the uppermost level. Most of Gooseberry Neck, including the observation towers, is owned by the Commonwealth of Massachusetts Department of Environmental Management and is open to the public as part of Horseneck Beach State Reservation (DCR Massachusetts, 2012; Wertz and Sanford, 1987a).

3.3.2 Historic Context

The Gooseberry Neck Observation Towers were built by the United States Army Corps of Engineers (USACE) in about 1942 as part of an elaborate network of coastal defenses up and down the East Coast of the United States. At the same time, the USACE rebuilt the Gooseneck Causeway (see Section 3.3). The towers were used to watch for enemy activity, while additional structures on the site (not extant) disguised auditory detection equipment (Wertz and Sanford, 1987a). A third concrete tower no longer survives. The taller of the two remaining towers now serves as a navigational aid and its location is indicated on the National Oceanic and Atmospheric Administration nautical chart for the region (DCR Massachusetts, 2012).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Gooseberry Neck Observation Towers appear to meet NRHP Criterion A for their role in coastal defense during World War II. The towers' site was strategically selected to offer unobstructed views to Buzzard's Bay, Rhode Island Sound, and the Atlantic Ocean. This maritime setting, along with the open, undeveloped character of Gooseberry Neck, are integral to the towers' historic significance.

3.4 The Gooseneck Causeway

3.4.1 Physical Description and Existing Conditions

The Gooseneck Causeway, also known as the Thomas Edward Pettey Causeway, is an approximately 0.25-mile-long stone and concrete roadway connecting Gooseberry Neck to Horseneck Beach and mainland Massachusetts. The causeway has a long history of construction, loss, and reconstruction due its vulnerability to nor'easters and hurricanes. Prior to construction of the first artificial causeway in 1924, residents and visitors could cross from Horseneck Point to Gooseberry Island on a naturally elevated sand bar. Access was limited to low tide conditions and could be perilous (WHS, 2013). The road surface is comprised of granite blocks and the seawall of the causeway consists of stone riprap. The causeway, along with most of Gooseberry Neck, is owned by the Commonwealth of Massachusetts Department of Environmental Management and is open to the public as part of Horseneck Beach State Reservation. The causeway provides access to Gooseberry Neck, including a public boat launch and a gravel parking lot (DCR Massachusetts, 2012; Wertz and Sanford, 1987b).

3.4.2 Historic Context

Gooseberry Neck was used to graze livestock from at least the early-eighteenth century, when animals were herded at low tide along the sandbar which connected the neck to the mainland. In the early-twentieth century, an attempt was made to subdivide Gooseberry Neck into residential lots for a summer colony (Wertz and Sanford, 1987b). The sandbar was developed into a causeway beginning in approximately 1913, with further improvements in about 1923. The hurricane of 1938 destroyed nearly every structure that stood along the coast in the vicinity of Gooseberry Neck. In about 1942, the causeway was rebuilt by the USACE to provide access for larger vehicles to the coastal defense installation on Gooseberry Neck (see Section 3.2). It was once again repaired in 1969 and 1974 (DCR Massachusetts, 2012; Wentz and Sandford, 1987b).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Gooseneck Causeway appears to meet NRHP Criterion A for its association with the development of seaside recreation in coastal Massachusetts and for its role in coastal defense during World War II. The property has unobstructed views to Buzzards Bay, Rhode Island Sound, and the Atlantic Ocean. This maritime setting is inextricably linked with the Gooseneck Causeway's historic use and significance.

3.5 The Westport Harbor Historic District

3.5.1 Physical Description and Existing Conditions

The Westport Harbor Historic District is a roughly 1,300-acre district encompassing the historic village center of Acoaxet, Richmond Pond, Cockeast Pond, and outlying rural residences along the West Branch of the Westport River. The district contains numerous nineteenth- and early-twentieth-century residences representing popular period styles, an Eastlake-style chapel, and several private clubs, as well as many miles of stone walls. A handful of eighteenth-century farm residences survive, along with several eighteenth-century cemeteries. Land use within the district is almost exclusively residential, although aerial imagery indicates some limited ongoing agricultural activity. Newer buildings are generally in keeping with existing development patterns, which include the use of deep setbacks, the use of forms and materials common to vernacular coastal building traditions, and the retention of existing stone walls. The district, therefore, conveys the feeling of a secluded vacation community (Wertz, 1987).

3.5.2 Historic Context

The area comprising the Westport Harbor Historic District was primarily agricultural in character well into the twentieth century. In the last decades of the nineteenth century, several summer colonies began to take shape within the Town of Westport, with the largest, known as Acoaxet, developing along the shoreline of Rhode Island Sound near Cockeast Pond. The colony attracted factory owners and professionals from Fall River to the north, and grew to include casinos, bathhouses, and hotels in addition to large private "cottages." Acoaxet continued to develop throughout the twentieth century but suffered widespread damage in the hurricane of 1938 (Wertz, 1987; WHS, 2013).

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Westport Harbor Historic District appears to meet NRHP Criteria A and C for its relationship to the development of seaside resort communities in coastal Massachusetts, and as a collection of representative eighteenth century farmsteads and popular nineteenth and early-twentieth century domestic architecture. Many of the contributing properties within the historic district enjoy expansive views of Rhode Island Sound, Buzzards Bay, and the Atlantic Ocean and were sited to take advantage of those views.

3.6 The Westport Point Historic District

3.6.1 Physical Description and Existing Conditions

The NRHP-Listed Westport Point Historic District is an approximately 86-acre district consisting of 233 contributing buildings, structures, objects, and sites located along Main Road, Valentine Lane, and Cape Bial Lane and comprising the historic core of the coastal village of Westport Point. Within the district, Main Road forms the primary north-south transportation route and terminates at the southern tip of Westport Point at a small cluster of commercial buildings adjacent to a marina. Main Road is densely built with eighteenth-and nineteenth-century residences with uniformly shallow setbacks along much of its length, conveying the feeling of an early-nineteenth-century port village (Wertz et. al., 1992).

The early history of the district is strongly associated with maritime commerce. The first town landing and ferry were operational in the early eighteenth century, shortly following the establishment of permanent English settlements on Westport Point (WHS, 2013). Cod was an initial focus of commercial fishing, with vessels from Westport Harbor primarily plying the waters off Nantucket and Newfoundland in the early eighteenth century (WHS, 2013). Yankee privateers operated from the relative seclusion of local harbors during the Revolutionary War. Expansion of whaling in the region started in the early nineteenth century and was associated the development of the local docks, wharves, and at least one shipyard within the district. Few of the extant houses in the district are related to the century-long whaling economy, but several of the existing stone wharves were likely constructed to serve the local whaling fleet (Wertz, 1992). The enduring maritime heritage of the district is primarily expressed by the historic docks and wharves and wharfhouses along Westport Point at the southern end of Main Road (Wertz, 1992). Fishing remains a significant economic activity in Westport and the Westport Point Historic District, in particular. Most of the buildings within the district are single-story to two-story wood-frame gable-roofed residences representing vernacular interpretations of architectural styles from the late-eighteenth century through the early-twentieth century. The historic homes of the district largely reflect a late nineteenth-century shift towards summer residences.

3.6.2 Historic Context

Westport Point is one of several villages which developed in the Town of Westport in the eighteenth century. By 1790, there were an estimated one dozen houses at the tip of the point. The village's protected harbor made in an attractive location for shipbuilding, fishing, whaling, and trading activities. The Point was initially owned by a small number of private parties, and maritime commerce was supported by docks and wharves along Horseneck (WHS, 2013). By 1770, pressure for improved facilities led to the subdivision of properties along the south end of Main Road and construction of both private and town-owned wharves. Buildings in the southern portion of the historic district were residences associated with the early maritime community, while land use in the northern part of the district was agricultural. The community experienced an economic decline with the abandonment of whaling in the late nineteenth century; however, the growth of seaside recreation in New England led to the construction of summer cottages at Westport Point from the 1870s onward. Summer residents also purchased and adapted existing buildings. At the turn of the twentieth century, educators, artists, and musicians comprised a large proportion of the summer colony. Among the most significant changes to the district after World War II were the demolition of a circa-1894 draw bridge spanning the East Branch of the Westport River in 1963 (DeVeuve, 2003) and the subsequent construction State Route 88 to the east of Main Road. The new highway and bridge allowed through traffic to the newly created Horseneck Beach State Park to bypass the historic waterfront village (Wertz, 1992). The Westport Point Historic District was listed in the NRHP in 1992 (Wertz, 1992). In 2006, a local Westport Point Historic District was designated, with a larger boundary than the NRHP district.

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Westport Point Historic District meets NRHP Criteria A and C for its association with the Town of Westport's maritime development, as an intact port village with buildings representing vernacular interpretations of eighteenth- and nineteenth-century styles, and as a collection of summer cottage architecture representing styles of the late-nineteenth and early-twentieth centuries. The history of the district is intimately associated with maritime commerce and activities and is reflected in its character as a New England seaside village. Maritime views from the southern portion of the district include waters of the East and West Branches of the Westport River and Westport Harbor. Elevated locations supported by granite outcrops have views that extend southward to Rhode Island Sound and the proposed wind farm. Properties at the northern end of the district enjoy views beyond Horseneck Point to the Elizabeth Islands, Martha's Vineyard, and the Atlantic Ocean (Wertz et. Al., 1992).

3.7 The Westport Point Local Historic District

3.7.1 Physical Description and Existing Conditions

There are 148 resources that contribute to the Westport Point Local Historic District. The district is located on either side of Main Road, roughly bounded by Charles Street to the north, Main Highway to the east, Hulda Cove and Westport Cove to the west and the East Branch Westport River to the south (Westport Historical Commission, 2022).

3.7.2 Historic Context

The development history of the Town of Westport is similar to other towns in coastal New England. From the beginning of its history, the majority of the town was agricultural in nature, including Westport Point. The first farm was established in 1700 by Christopher Gifford. In 1729 a public landing was developed on Westport Point and a ferry service was run to Horseneck Beach. By 1770 the Gifford house was the only house on the point and additional wharves were established for the increasing whaling industry (Westport Historical Commission, 2017).

By 1800, fifteen houses were located on Westport Point, as well as wharves, shops, a windmill, a blacksmith shop, a distillery, and other businesses. From the 1820s to the 1840s, additional buildings were constructed including larger homes and a post office. As in many of the coastal New England towns, in the late nineteenth century, development of summer cottages began on Westport Point (Westport Historical Commission, 2017).

3.7.3 NRHP Criteria and the Maritime Visual Setting

As with the NRHP-listed district, the Westport Point Local Historic District meets NRHP Criteria A and C for its association with the Town of Westport's maritime development, as an intact port village with buildings representing vernacular interpretations of eighteenth- and nineteenth-century styles, and as a collection of summer cottage architecture representing styles of the late-nineteenth and early-twentieth centuries. The history of the district is intimately associated with maritime commerce and activities and is reflected in its character as a New England seaside village. Maritime views from the southern portion of the district include waters of the East and West Branches of the Westport River and Westport Harbor. Elevated locations supported by granite outcrops have views that extend southward to Rhode Island Sound and the proposed wind farm. Properties at the northern end of the district enjoy views beyond Horseneck Point to the Elizabeth Islands, Martha's Vineyard, and the Atlantic Ocean (Wertz et. al., 1992).

3.8 The Westport Point Revolutionary War Properties

3.8.1 Physical Description and Existing Conditions

The Westport Point Revolutionary War Properties district extends from the southern end of Westport Point, across Westport Harbor (including Whites Flat and Cory's Island), to the western end of Horseneck Point. As stated above, Westport Point was a seaport village and developed into a summer colony in the mid-to-late nineteenth century.

3.8.2 Historic Context

Westport Harbor and Westport Point was a privateering center during the Revolutionary War. During the Revolutionary War, sailors who previously worked on whaling, merchant, and fishing vessels became privateers. For the most part, the privateer's vessels were built outside of Westport. The natural protection of Westport Harbor as well as the narrow channels, islands, and sandbars, made it difficult for large British ships to navigate the harbor; however, the smaller privateer vessels could easily maneuver and remain hidden. The British attacked Westport from the water and did not make landfall (Ford, 2001).

3.8.3 NRHP Criteria and the Maritime Visual Setting

The Westport Point Revolutionary War Properties district is significant under Criterion A for the role the area played in protecting the Massachusetts coastline from the British during the Revolutionary War. It's significance is directly tied to its maritime setting and its location on Westport Harbor. The properties on Westport Point have views beyond Horseneck Point to the Elizabeth Islands, Martha's Vineyard, and the Atlantic Ocean and Horseneck Point has unobstructed views of the ocean (Wertz et. al., 1992).

3.9 The Horseneck Point Lifesaving Station

3.9.1 Physical Description and Existing Conditions

The Horseneck Point Lifesaving Station Is located at 241 East Beach Road at the intersections of East and West Beach Roads and Gooseberry Causeway. The building is a 32-foot by 16-foot, wood frame, post and beam building constructed in 1888 as the 69th lifesaving station constructed by the Massachusetts Humane Society. Barn-style swinging doors are located on the main, eastern, façade and one central window on each of the northern and southern elevations and a vented cupola is located in the center of the roof. The building has been relocated from its original location at the entrance to Westport Harbor at the western end of Horseneck Beach (Flair and Gillespie, 2011).

3.9.2 Historic Context

The Horseneck Point Lifesaving Station was one of the last lifesaving stations built by the Massachusetts Human Society. Its location at the entrance to the harbor was chosen as it was a dangerous location to launch a boat due to the water's current and existing jetty. In 1898 the building was moved to its current location and was discontinued in 1913. In the 1920s, the building was used as a restaurant and a porch and dormers were added. The restaurant closed in 1966 and was eventually used as a residence and then purchased by the State of Massachusetts and is currently a museum (Flair and Gillespie, 2011).

3.9.3 NRHP Criteria and the Maritime Visual Setting

The Horseneck Point Lifesaving Station is eligible for listing on the NRHP under Criterion A as an extant example of a lifesaving station constructed by the Massachusetts Humane Society. Although the building had been altered in the past, it has been restored to its original design.

As a former lifesaving station, the building intrinsically has a strong maritime setting, both in its original and current location. Lifesaving stations were constructed to be able to help sailors along treacherous coastlines. Lifesaving stations were manned and had lifeboats and other safety equipment. The building is located on Horseneck Point with views of the Atlantic Ocean to the west, south and east.

3.10 The Clam Shack

3.10.1 Physical Description and Existing Conditions

The Clam Shack Restaurant is located at 241 East Bach Road on the same parcel as the Horseneck Point Lifesaving Station described above. The building was constructed in 1940 and is a triangular-shaped building built by Ali Alberdeen to be used as a clam shack restaurant. The roof is an almost sweeping, pagoda-like Shape. A door is located centrally on the southeaster elevation with double one-over-one windows on either side. The main entrance is located on the southern façade which is little more than double doors. Two windows are located on the western elevation and a door is centered on the northern elevation. Originally, a take-out window was in the current location of the two doors on the southern façade (Falir, 2011).

3.10.2 Historic Context

Beginning in the mid-to-late nineteenth century and continuing to today, Westport has been a popular destination for summer vacations. Seafood stands and clam shacks were opened throughout New England coastal towns in the early twentieth century. The Clam Shack Restaurant's location on Horseneck Point at the intersections of East and West Beach Roads and Gooseberry Causeway on East Horseneck Beach is an ideal location for a clam shack. In 1966 the restaurant closed was eventually used as a residence and then purchased by the State of Massachusetts and is currently the visitors center for the Westport Fisherman's Association (Flair, 2011).

3.10.3 NRHP Criteria and the Maritime Visual Setting

The Clam Shack Restaurant is eligible for listing on the NRHP under Criterion A as an extant example of an early clam shack restaurant as well as Criterion C for its unique architectural design and shape.

The building has a strong maritime setting and is located on Horseneck Point with views of the Atlantic Ocean to the west, south and east.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Maritime Infrastructure Survey

4.1.1 Purpose and Intended Outcome

The *Town of Westport 2016 Master Plan* identifies the desire for residents, school-aged children, and visitors to have a greater understanding of the town's significant historic and cultural resources (Town of Westport, 2016). The purpose of this mitigation measure is to provide funding to survey and document maritime heritage resources including historic wharves, docks, buildings, and other infrastructure associated with the historic properties identified in this HPTP. The survey will include a focused historic context for the interpretation and evaluation of resources contributing to each district's significance in historic maritime defense, fishing, whaling, and related industries. The updated documentation will enhance local and state efforts to preserve elements of the historic districts that are associated with over three centuries of maritime activity and the distinct character of the local villages and communities.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review of existing archival sources related to historic maritime infrastructure, including interviews with local researchers and other knowledgeable parties, as applicable;
- Photography and mapping of existing conditions;
- Consultation with Participating Parties;
- Preparation of updated MHC inventory forms for individual properties or districts to be distributed to the Participating Parties for review and comment; and
- Drafting of final survey report which will incorporate any comments received and be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant selected will prepare draft MHC Inventory Forms in consultation with the Participating Parties. The forms will be distributed to the Participating Parties for review and comment and a final survey will be developed incorporating any comments received. The final survey will be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with the following standards:

- The *Secretary of the Interior's Guidance on the Identification of Historic Properties* (36 CFR 800.4);
- The *Secretary of the Interior's Standards and Guidelines – Professional Qualifications Standards, for Archaeology, History, Architectural History and/or Architecture* (62 FR 33708);
- Massachusetts Historical Commission guidance;
- The Town of Westport's Community Preservation Commission's guidance, as applicable; and
- The Town of Westport's Cultural Council's guidance, as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft deliverables, including photographs and maps; and
- Final deliverables.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Adaptive Use Guidance

4.2.1 Purpose and Intended Outcome

Information developed from the Historic Maritime Infrastructure Survey will provide a basis for creating appropriate guidance on the preservation and adaptive use of historic wharves, docks, and buildings within the Westport Harbor and Westport Point historic districts. Such guidance may include methods to retain historic materials, finishes, and design elements while sympathetically modifying elements of superstructures or building interiors to accommodate changing commercial needs. Maritime industries are an important element of Westport's history, economy, and culture. Maintaining the integrity of the town's historic assets while supporting economically sustainable marine commerce aligns with the town's objective to:

> *Support fishing infrastructure such as preservation of historic piers, docks, water access and landings, as well as policies that could promote small boat building and repair, and inputs into the marine and fishing industry* (Town of Westport. 2016).

The intended outcome of this mitigation measure is to provide context-appropriate guidance on methods to preserve Westport's historic maritime infrastructure and appropriately adapt it to the current and future needs of the resident communities. Maintenance of commercial fishing and associated commerce is an effective means of retaining the local traditions and knowledge that contribute to Westport Harbor's and Westport Points unique characters and both residents' and visitors' sense of place.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Outreach to the Participating Parties, property-owners, planners, and representatives of the local commercial fishing community to identify current maritime infrastructure needs and preservation opportunities;
- Development of specific guidelines for adapting the extant historic wharves, docks, and other infrastructure to current needs in a manner that retains historic materials, design, and character;
- Distributing the draft guidelines to the Participating Parties for review and comment; and
- The development of final report, incorporating any comments received, to be distributed to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release an RFP for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.2.2. The consultant selected will consult with the Participating Parties to prepare draft guidelines. The guidelines will be distributed to the Participating Parties for review and comment and final guidelines will be developed incorporating any comments received. The final guidelines will be distributed to the Participating Parties

4.2.4 Standards

The project will comply with the following standards:

- *Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* (Nelson, 1988);
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- The Secretary of the Interior's *Guidelines for Architectural and Engineering Documentation* (NPS, 2003);
- The Town of Westport's Building Department guidance and regulations, as applicable;
- The Town of Westport's Community Preservation Commission's guidance, as applicable; and
- The Town of Westport's Cultural Council's guidance, as applicable.

4.2.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft deliverables, including photographs and maps; and
- Final deliverables.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Massachusetts Historic Properties, February 10, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 13 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM, NINE HISTORIC PROPERTIES SUBJECT TO ADVERSE EFFECTS IN THE TOWN OF AQUINNAH, DUKES COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 13 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Nine Historic Properties

Town of Aquinnah, Dukes County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	71 Moshup Trail The Leonard Vanderhoop House The Edwin DeVries Vanderhoop Homestead The Tom Cooper House The Theodore Haskins House 3 Windy Hill Drive The Gay Head-Aquinnah Town Center Historic District The Gay Head-Aquinnah Shops The Gay Head-Aquinnah Coast Guard Station Barracks
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
PAPE	Preliminary Area of Potential Effects
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
TCP	Traditional Cultural Property
WTG	Wind turbine generator

1.0 EXECUTIVE SUMMARY

This draft, applicant-proposed Historic Property Treatment Plan (HPTP) for 71 Moshup Trail, which is a Massachusetts Historical Commission (MHC) Inventory Site; the Leonard Vanderhoop House, which is a MHC Inventory Site; the Edwin DeVries Vanderhoop Homestead, which is listed on the National Register of Historic Places (NRHP); the Tom Cooper House, which is an MHC Inventory Site; the Theodore Haskins House, which is an MHC Inventory Site; 3 Windy Hill Drive, which is an MHC Inventory Site; the Gay Head – Aquinnah Town Center Historic District, which is listed on the NRHP; the Gay Head – Aquinnah Shops, which is an MHC Inventory Site; and the Gay Head-Aquinnah Coast Guard Station Barracks, which is an MHC Inventory Site (hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA). The final HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

[1] The timeline is subject to change and is based on current available information.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

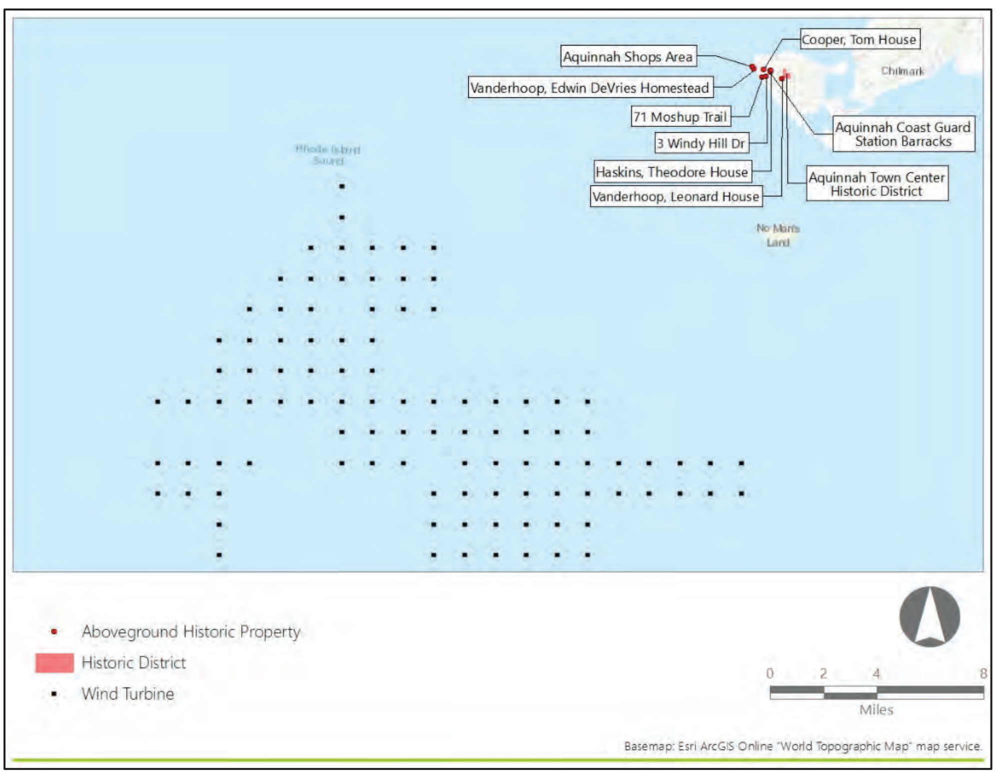
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of a ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The State of Massachusetts preservation restrictions are outlined in Massachusetts General Law Chapter 184, Sections 31-33. Any mitigation work associated with the historic properties will comply with the conditions of all extant historic preservation easements. Additional information regarding compliance with extant preservation restrictions appears in Section 5.0, Implementation. The MHC holds a preservation easement on the Aquinnah Public Library/Gay Head School (a contributing building to the Gay Head – Aquinnah Town Center Historic District) per Massachusetts General Law Chapter 184, Sections 31-33.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Wampanoag Tribe of Gay-Head (Aquinnah)
- The Martha's Vineyard Commission
- The Gay Head Lighthouse Advisory Committee
- The Town of Aquinnah
- The Massachusetts Historical Commission.[2]

Revolution Wind anticipates these parties, and any subsequently identified parties, will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

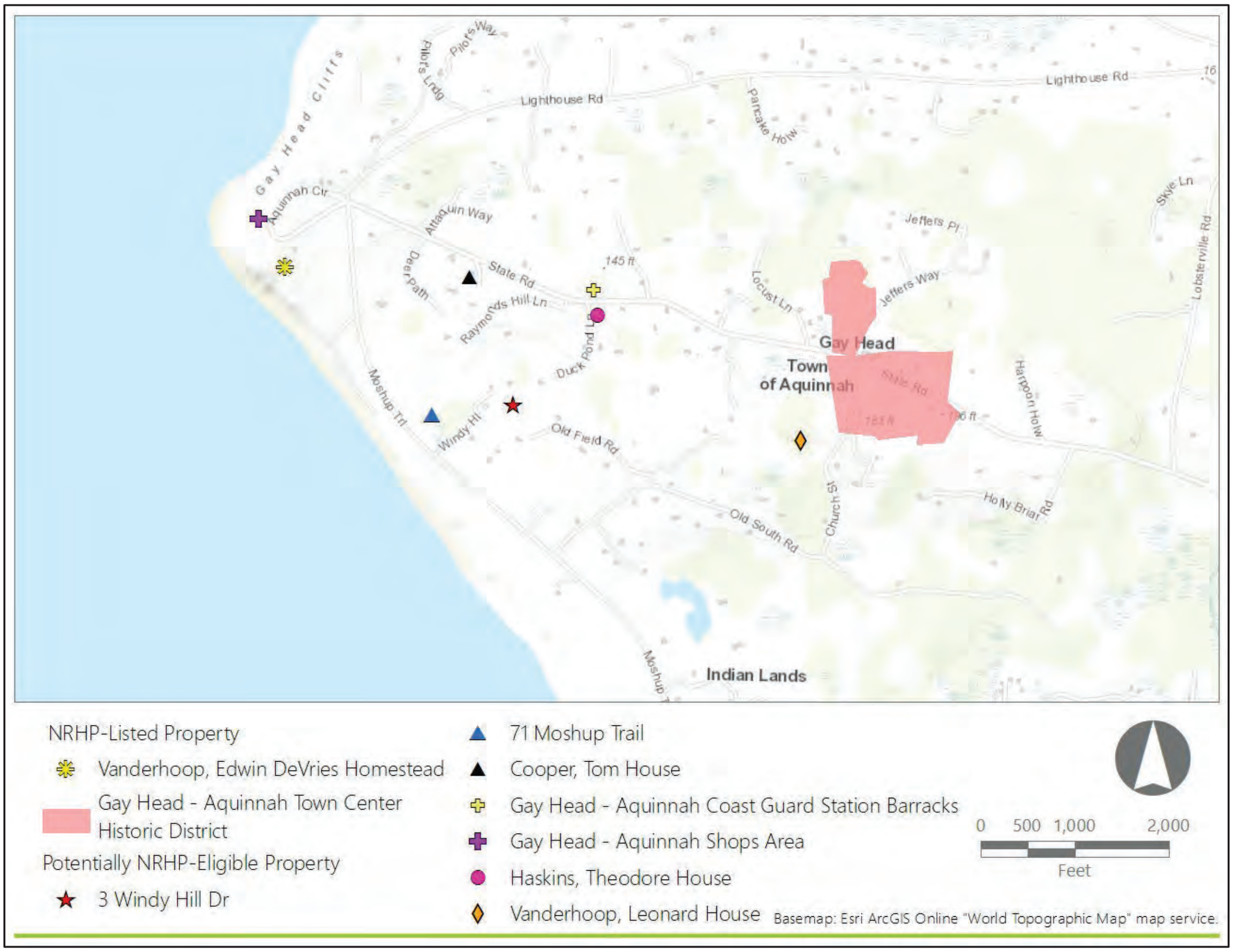
This HPTP addresses eight historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
71 Moshup Trail	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.31 (MHC)	Private	Historic Buildings and Structures
Leonard Vanderhoop House	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.4 (MHC)	Private	Historic Buildings and Structures
Edwin DeVries Vanderhoop Homestead	NRHP-Listed	Town of Aquinnah	MA	GAY.40 (MHC); 06000784 (NPS)	Municipal	Historic Buildings and Structures
Tom Cooper House	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.53 (MHC)	Private	Historic Buildings and Structures
Theodore Haskins House	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.51 (MHC)	Private	Historic Buildings and Structures
3 Windy Hill Drive	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.55 (MHC)	Private	Historic Buildings and Structures
Gay Head – Aquinnah Town Center Historic District	NRHP-Listed	Town of Aquinnah	MA	GAY.A (MHC); 99000187 (NPS)	Municipal; Private	Historic Buildings and Structures
Gay Head – Aquinnah Shops	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.B (MHC)	Private; Tribal Nation	Historic Buildings and Structures

Gay Head-Aquinnah Coast Guard Station Barracks	MHC Historic Inventory Site	Town of Aquinnah	MA	GAY.52	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Sections 3.3. through 3.10, each property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this document.

The historic properties included in this HPTP are all considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures" which includes buildings and associated properties historically used as residences. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting. Historic commercial fishing activities were focused along the eastern shores of Menemsha Pond, which afforded relatively sheltered harbor and access to Vineyard Sound to the north.

Topography and landcover also play critical roles in defining both the historic settings and existing visual settings for each historic property. Of these two factors, the latter has been generally subject to greater change since the period of original construction and/or period of significance for many historic properties located in the Town of Aquinnah. Mid- to late-twentieth century reforestation has transformed many of the formerly open, agrarian lands of Martha's Vineyard and constrained local viewsheds from numerous buildings once set on or near agricultural or pasture lands (e.g. Seccombe, 2010). The extensive agricultural heritage in the area is now largely expressed by the stone walls constructed along former pastures, fields, and roads and the surviving farmhouses and barns. Post-1950 residential construction has affected the settings for a smaller number of historic properties but may have diminished the integrity of historic settings for specific properties. The extensive forest cover affords privacy in many residential areas, but limits direct ocean views.

The topography of Aquinnah is strongly influenced by the last glaciation. The elevated Gay Head (Aquinnah) Cliffs along the western shoreline and the highlands in the central section of the town were formed by deformation and upthrusting of ancient sediments as the ice advanced over the area approximately 24,000 years ago (Oldale and O'Hara, 1984). Where vegetation is absent or sparse, views towards the Project may be available from these higher elevations. The bordering areas along the Menemsha Pond to the east and along the southwestern shores have relatively low relief. Direct views of the ocean horizon are screened from Menemsha Pond by the Gay Head (Aquinnah) Cliffs. In the shoreline areas along the southwestern shores, even the commonly low tree and shrub canopies of the island may screen ground-level views of ocean due to the limited relief.

3.3 71 Moshup Trail

3.3.1 Physical Description and Existing Conditions

71 Moshup Trail is a one-and-one-half-story vernacular residence with a gable roof and wood shingle siding. Notable features include the semi-hexagonal tower and full-width porch on the primary (northeast elevation). Windows are generally two-over-two wood sash, and the primary entry door is offset on the northeast elevation. A single-story shed-roofed addition and a gabled dormer window are located on the

southwest elevation. The building has an asphalt shingle roof and rests on a stone foundation. A gable-roofed garage is also located on the roughly 9-acre lot.

3.3.2 Historic Context

Throughout the eighteenth century, most residential settlement was concentrated in the western and southern parts of the present-day Town of Aquinnah, which constituted the reservation lands of the Wampanoag Tribe of Gay Head (Aquinnah). Individual residences were linked by a network of paths, and by the mid-nineteenth century, several east-west roads connected the residential areas to the Gay Head Light and Clay Cliffs of Aquinnah to the west and the present-day Town of Chilmark to the east (Harrington, 1998a). In the 1860s, the "District of Gay Head" was established by the Massachusetts General Court. The district was incorporated as the Town of Gay Head in 1870, despite the objections of the Wampanoag residents, who viewed the town's creation as the alienation of their lands in violation of the Federal Non-Intercourse Act of 1790 (WTGHA, 2022). At the time, tribal members accounted for all of the town's 227 residents, and the survey and privatization of their land allowed non-tribal owners to acquire property in the town. By 1895, at least 18 non-tribal individuals owned land in the Town of Gay Head, and that number would increase in the following decades. The year-round (primarily Wampanoag) population declined during the twentieth century as communal economic systems dependent on fishing and agriculture waned. Meanwhile, visitation from off-island residents increased dramatically, and many new residences were constructed for use as summer rentals or vacation homes (Harrington, 1998a).

The residence at 71 Moshup Trail was built in approximately 1920. Its primary elevation faces northeast, towards a now-inaccessible extension of Old South Road which provided access to a small number of residences in the area during the early twentieth century. The current roadway, Moshup Trail, was built in 1956, extending east from Aquinnah Circle and providing access to home sites and points of interest along the town's south shore (Harrington, 1998b).

3.3.3 NRHP Criteria and the Maritime Visual Setting

71 Moshup Trail appears to meet National Register Criterion C as a typical example of an early twentieth-century residence in keeping with the characteristic scale, form, and materials of the vernacular building tradition of coastal New England. The property's natural landscape and maritime visual setting are a key component of its historic significance as an early-twentieth-century vernacular seaside residence.

3.4 The Leonard Vanderhoop House

3.4.1 Physical Description and Existing Conditions

The Leonard Vanderhoop House, located at 5 Church Street, is a one-and-one-half-story Greek Revival-derived vernacular residence with multiple additions sited on approximately 5.6 acres. The primary volume consists of a gable-and-ell modified (after 1998) with the addition of wall dormers. A small single-story addition to the west has a flat roof supporting an open deck. The exterior is clad in wood shingle and the roof is of asphalt shingle. The primary elevation faces northeast to an unpaved extension of Church Street.

3.4.2 Historic Context

The Leonard Vanderhoop House was built in approximately 1850 and was one of several residences, along with a school, church, and parsonage, which formed the nucleus of the Gay Head community along present-day Old South Road during the mid-nineteenth century. Leonard L. Vanderhoop (1855-1934), the earliest identified resident of the house, was a restaurant owner and Town Treasurer. The Vanderhoop family, descended from Leonard's parents William A. Vanderhoop and Beulah Salsbury, are a prominent Aquinnah family whose members own many properties and have held key positions in the town government as well as in the Wampanoag Tribe of Gay Head (Aquinnah) (Harrington, 1998c).

In 1870, the same year that the Town of Gay Head was incorporated, the improvement of present-day State Road by the State of Massachusetts dramatically altered the development patterns within the town. The new road was laid out north of Old South Road along the existing path that connected Chilmark to the east to the Gay Head Lighthouse. Nearly all of the existing buildings were subsequently moved from the older community around Old South Road to the new center of activity around the intersection of State Road and Church Street. By 1926 only a single unoccupied house remained at the old settlement (Harrington, 1998a). The Leonard Vanderhoop House was relocated during this period to its current site at 5 Church Street. It remains in the Vanderhoop family today.

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Leonard Vanderhoop House has been significantly altered with the replacement of windows and doors and the introduction of wall dormers. However, it retains its overall massing and its historic setting. The house's relocation after 1870 in response to changing settlement patterns contributes to its historic significance. The Leonard Vanderhoop House appears to meet National Register Criterion A for its association with the mid-nineteenth century settlement along Old South Road. The Vanderhoop family is one of the most well-known families in the history of the Town of Aquinnah. The house is a Shingle-style building, typical of the buildings located on Martha's Vineyard, and has views to the water afforded by its relatively high elevation on the moraine. The remaining ocean views are associated with a once more expansive ocean viewshed that has been partially screened by reforestation.

3.5 The Tom Cooper House

3.5.1 Physical Description and Existing Conditions

The Tom Cooper House, located at 1 Sunset Lane, is a two-story residence consisting of a primary gable-roofed volume with multiple additions sited on approximately 0.5-acre. The exterior is clad in wood shingle and the roofs are clad in asphalt shingle. The residence appears to have been heavily remodeled in about 2005. All of the windows and doors appear to be modern replacements. Other alterations include the addition of a hipped-roof volume atop a walk-out basement, the enlargement of the original volume with wall dormers, and the addition of a visually prominent stone chimney.

3.5.2 Historic Context

Sunset Lane is a short road extending south from State Road. It was developed in the early-twentieth century, following the improvement of State Road. The Tom Cooper House was built during the last quarter of the nineteenth century. Tom Cooper was the first known occupant of the house, during the early twentieth century. The Cooper family operated a restaurant out of the residence in the 1920s, later converted to an ice cream shop in the 1960s (Harrington, 1998d). The building was substantially remodeled in approximately 2005 (Town of Aquinnah, 2022).

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Tom Cooper House appears to meet National Register Criteria A and/or C for its architecture and its role as a restaurant contributing to the development of the tourism industry in Gay Head. The natural landscape and maritime visual setting appear to be key components that contribute to the historic significance of the Tom Cooper House.

3.6 The Theodore Haskins House

3.6.1 Physical Description and Existing Conditions

The Theodore Haskins House, also known as the C. Adrian Vanderhoop House, located at 72 State Road/1150 State Road, is a one-and-one-half-story Colonial Revival-derived vernacular residence consisting of a gable-roofed main volume with multiple dormers and additions sited on approximately 1.0 acre. The exterior has wood shingle siding and an asphalt shingle roof, atop a concrete masonry unit foundation. A substantial brick chimney is located on the primary elevation. Windows are generally wood sash and appear original.

3.6.2 Historic Context

The Theodore Haskins House was built in the first quarter of the twentieth century for Theodore E. Haskins, who subsequently sold the property to C. Adrian Vanderhoop (1880-1956), a member of the prominent Vanderhoop family of Gay Head (see Section 3.3.2). In 1957, the property was acquired by the Gentry family, who still own it today (Harrington, 1998e; Town of Aquinnah, 2022).

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Theodore Haskins House appears to meet National Register Criterion C as an intact and representative example of an early-twentieth-century residence in keeping with the characteristic scale, form, and materials of the vernacular building tradition of coastal New England with views to the ocean. The property is sited along the southwestern flank of an elevated glacial moraine with slopes oriented towards the Project. The remaining ocean views from the property are surviving elements of a once more expansive ocean viewshed that has been diminished by post-1950 reforestation.

3.7 3 Windy Hill Drive

3.7.1 Physical Description and Existing Conditions

The house at 3 Windy Hill Drive (current address, 5 Windy Hill Drive) is a two-story Colonial Revival-derived vernacular residence with hipped roofs, wood shingle siding, and a raised basement, sited on approximately 0.5 acre. The residence was significantly remodeled in the late-twentieth- or early-twenty-first century, with little or no historic exterior materials remaining.

3.7.2 Historic Context

The house at 3 Windy Hill Drive was built in the first quarter of the twentieth century. It was originally accessed via a network of trails and roads which extended south from Old South Road. Windy Hill Drive is now accessible from Moshup Trail, which was begun in 1956 to provide access to residential lots and points of interest on the town's south shore (Harrington, 1998f; Town of Aquinnah, 2022).

3.7.3 NRHP Criteria and the Maritime Visual Setting

The address 3 Windy Hill Drive appears to meet National Register Criterion C as an intact and representative example of a residence in keeping with the characteristic scale, form, and materials of the vernacular building tradition of coastal New England, and in particular Martha's Vineyard with views to the ocean. The natural landscape and maritime visual setting appear to be key components that contribute to the historic significance of 3 Windy Hill Drive.

3.8 The Edwin DeVries Vanderhoop Homestead

3.8.1 Physical Description and Existing Conditions

The Edwin DeVries Vanderhoop Homestead, located at 35 Aquinnah Circle, is a two-story wood-frame vernacular residence with complex massing consisting of multiple intersecting gable roofed volumes along with a single-story rear addition. The building has wood shingle siding, wood shingle roofing, and a granite foundation. Windows are generally two-over-two double hung wood sash with simple wood surrounds. The primary (north) elevation is arranged symmetrically, with two single-story entry porches flanking a two-story gable-roofed one-bay-wide projection. A 12-footby-29-foot open terrace (built in 2005) along the rear elevation of the of the house and provides expansive views of the ocean waters framed by the slightly elevated sections of the cliffs to the north. The existing terrace replaced a wooden deck. The residence is sited on an approximately 3.8-acre lot which extends southwest to the Clay Cliffs of Aquinnah and consists of grass lawn, mown fields, and low vegetation.

The house consists of two main side-gable volumes which are offset and are each roughly the size of a modest Cape Cod-style residence of the nineteenth century. The presence of a full basement beneath one of the volumes and the absence of a basement beneath the other suggests that one of the volumes may have been relocated from a previous site. Historic imagery shows that a barn and several additional outbuildings were once located on the property but are no longer extant (Parcon et. al., 2006). A public walking trail leads through the property to the shoreline. The property is owned by the Town of Aquinnah and managed as part of the 49-acre Aquinnah Headlands Preserve, while the building serves as the Aquinnah Cultural Center and Aquinnah Wampanoag Indian Museum (MVLB, 2016; Aquinnah Cultural Center, 2021).

3.8.2 Historic Context

The Edwin DeVries Vanderhoop Homestead was built or assembled from one or more existing buildings between 1890 and 1897. Edwin DeVries Vanderhoop (1848-1923) was one of nine children born in Gay Head to William Adriaan Vanderhoop, a Dutch-Surinamese settler, and Beulah Salsbury, a member of the Wampanoag Tribe of Gay Head (Aquinnah). Edwin D. Vanderhoop worked as a whaling captain and served in the Massachusetts legislature. He purchased the lot upon which his homestead stands in 1890. His widow Mary A.C. Vanderhoop (1860-1935) inherited the homestead upon his death and the property remained in the Vanderhoop family until 2003. In that year, the property was sold to the Marsh Hawk Land Trust and subsequently transferred to the Town of Aquinnah, subject to conservation and preservation restrictions (Parcon et. al., 2006). The building has been rehabilitated since that time.

3.8.3 NRHP Criteria and the Maritime Visual Setting

The Edwin DeVries Vanderhoop Homestead meets National Register Criteria A and C in the areas of Architecture, Native American Ethnic Heritage, and Social History. It derives significance from its association with the prominent Vanderhoop family of the Wampanoag Tribe of Gay Head (Aquinnah), from its association with civic and social life in the community, and as a representative example of a late-nineteenth-century residence embodying the building traditions of coastal New England. The period of significance is circa 1890/1897 to 1956 (Parcon et. al., 2006). The rear of the residence and surrounding areas of the property retain views of the Atlantic Ocean to the south. The property's location atop the Gay Head Cliffs and the views to the sea are integral to its historic setting.

3.9 Gay Head – Aquinnah Town Center Historic District

3.9.1 Physical Description and Existing Conditions

The Gay Head – Aquinnah Town Center Historic District is a collection of 23 contributing buildings, two contributing objects, and five non-contributing buildings grouped near the intersection of State Road and Church Street, at the approximate geographic center of the Town of Aquinnah. The contributing buildings consist of historic public, semi-public, residential, and agricultural buildings related to the civic, religious, and economic development of the Town of Aquinnah in the nineteenth and early twentieth centuries. The 23 contributing buildings are enumerated in Table 3.9-1.

Table 3.9-1. Contributing buildings within the Gay Head – Aquinnah Town Center Historic District

Building Name and/or Description	Address	Construction Date
The Aquinnah Town Hall/Community Center is a single-story end-gable building with a moderately pitched roof, wood shingle siding, and wood windows and doors. The primary (south) elevation consists of a projecting entry vestibule featuring a double leaf paneled door flanked by six-over-six windows. The east and west elevations include single-story ells and additions which are consistent with the form and materials of the main volume.	955 State Road	Circa 1929
The former post office and residence is a small single-story shed-roofed building with a roughly square plan and wood shingle and wood board siding. The building appears to have been unoccupied since at least the late 1990s and is overgrown with vegetation.	980 State Road	Circa 1920s
The Aquinnah Public Library/Gay Head School is a single-story Greek Revival-style end-gable building with wood shingle siding atop a granite foundation. The building has six-over-six windows and modest wood cornice returns, corner boards, and fascia boards. A wood deck and ramp added in the twenty-first century provide access to the library's main entrance on the south elevation. The primary historic entrance is on the north elevation and consists of a hipped-roof vestibule with doors on the east and west, which recall the building's use as a school from the time of its construction until 1968. The building was moved to its present location in 1878 (Harrington, 1998a).	1 Church Street	Circa 1844
The Gay Head Community Baptist Church is a one-and-one-half-story end-gable Greek Revival-style church with a square tower centrally located on the primary (south) elevation. The moderately-pitched roof is clad in asphalt shingle and the building has wood clapboard siding and Greek Revival-style wood cornice returns, corner boards, and fascia boards, atop a granite foundation. The outhouse located northeast of the church is also a contributing building to the historic district. It is not known whether the outhouse is still standing. The church was moved to its present location in 1907 (Harrington, 1998a).	2 Meetinghouse Way	Circa 1850

Building Name and/or Description	Address	Construction Date
The Minister's House/Parsonage is a one-and-one-half-story end-gable residence with modest Greek Revival-style detailing. The building has wood shingle siding and simple cornice returns, corner boards, and fascia boards, atop a stone foundation. The primary (north) elevation is three bays wide, with an offset door and two six-over-six windows at the first floor, with two additional six-over-six windows in the gable end. A secondary entrance is located in a single-story rear addition. The parsonage was moved to its present location in 1907 along with the church (Harrington, 1998a).	3 Church Street	Circa 1856
The Linus S. Jeffers Residence is a one-and-one-half-story Cape Cod-derived vernacular residence with gable-and-ell massing, wood shingle siding, shed dormer windows, and an enclosed single-story porch.	4 Jeffers Way	Late-nineteenth century
The Isaac Rose/Charlie Vanderhoop House, Barn, Cottage, and Shed/cottage comprise a nineteenth-century farmstead sited on approximately 3.7 acres. The residence is a one-and-one-half-story cross-gabled Victorian Eclectic-derived vernacular building with wood shingle siding, ornate sawn vergeboards, an enclosed porch, and a circa-2005 addition.	38 South Road / 890 State Road	Mid-nineteenth century
The Adriaan Vanderhoop House, Barn, and Outhouse comprise a nineteenth-century farmstead sited on approximately 3.1 acres. The residence is a small single-story gable-roofed vernacular building with a central brick chimney, wood shingle siding, two-over-two windows, and a plank door.	46 South Road / 962 State Road	Late nineteenth century
The Lyman Madison House is a one-and-one-half-story vernacular residence with an end gable orientation, wood shingle siding, and a three-bay primary elevation with an offset door.	57 South Road / 903 State Road	Late nineteenth century
The house at 59 South Road/905 State Road is a one-and-one-half-story former boathouse clad in wood shingle atop a raised concrete block foundation. The building has a narrow gable-roofed wall dormer on the south elevation and a single-story wing on the east.	59 South Road / 905 State Road	Circa 1900
The Totem Pole Inn property consists of six buildings on an approximately 6.9-acre parcel, including an Innkeeper's Residence, four cottages, and a shed. The Innkeeper's Residence is a one-and-one-half-story Craftsman-style residence with wood shingle siding, a dormered gable roof, and an inset porch with cobblestone piers. The cottages are stylistically varied but are unified though their use of wood shingle sliding and cobblestone foundations. The shed also has wood shingle siding.	1-9 Totem Pole Way	Circa 1920s

The two contributing objects within the historic district are World War I monuments erected in 1918 and 1919 and currently located in front of the Aquinnah Town Hall. The monuments consist of bronze plaques affixed to boulders. According to the west monument's inscription, the Town of Gay Head (Aquinnah) contributed the "largest number of men in proportion to its population of any town in New England" to serve in the United States armed forces during the war.

Two of the five non-contributing buildings within the historic district are part of the complex of municipal buildings at 955 State Road. The Town Office Building (1989), east of the Town Hall, is a single-story gable-roofed building with wood shingle siding and six-over-six windows. East of the Town Office Building, the Fire Station (circa 1959) is a single-story gable-roofed building with wood shingle siding. Both buildings recall the scale, form, and materials of the 1929 Town Hall. The remaining three noncontributing buildings within the historic district are residences at 2 Jeffers Way, 44 South Road/920 State Road, and 61 South Road/ 917 State Road, all constructed in the 1960s or later.

3.9.2 Historic Context

Throughout the eighteenth century, most residential settlement was concentrated in the western and southern parts of the present-day Town of Aquinnah, which constituted the reservation lands of the Wampanoag Tribe of Gay Head (Aquinnah). Individual residences were linked by a network of paths, and by the mid-nineteenth century, several east-west roads connected the residential areas to the Gay Head Light and Clay Cliffs of Aquinnah to the west and the present-day Town of Chilmark to the east. Throughout the late eighteenth and nineteenth centuries, the community's population was roughly 200 (Harrington, 1998a).

The Gay Head community's civic and religious functions primarily took place within private residences until the mid-nineteenth century. The town's first and only purpose-built school building (now, the Aquinnah Public Library) was constructed prior 1844 north of present-day Old South Road. It was used for a variety of civic, social, and religious purposes in the years and decades before the community erected additional public buildings, and town records show that maintenance and upgrades to the building were frequent. The Baptist congregation of Gay Head met in the school before the Gay Head Community Baptist Church was constructed just north of the school in 1850. Within a few years, the Massachusetts Missionary Society supplied funding for a parsonage which was constructed in 1856 in order to attract a year-round minister to the church. The school, church, and parsonage, along with several additional residences, formed the nucleus of the Gay Head community along Old South Road in the mid-nineteenth century (Harrington, 1998a).

In the 1860s, the "District of Gay Head" was established by the Massachusetts General Court. The district was incorporated as the Town of Gay Head in 1870, despite the objections of the Wampanoag residents, who viewed the town's creation as the alienation of their lands in violation of the Federal Non-Intercourse Act of 1790 (WTGHA, 2022). At the time, tribal members accounted for all of the town's 227 residents, and the survey and privatization of their land allowed non-tribal owners to acquire property in the town. By 1895, at least 18 non-tribal individuals owned land in the Town of Gay Head, and that number would increase in the following decades (Harrington, 1998a).

In the same year that the Town of Gay Head was incorporated, the improvement of South Road (now, State Road) by the State of Massachusetts dramatically altered the development patterns within the town. The new road was laid out north of Old South Road along the existing path that connected Chilmark to the east to the Gay Head Lighthouse. Several buildings were subsequently moved from the older community around Old South Road to the new center of activity around the intersection of South Road and Church Street. The school was relocated in 1878, while the church and parsonage were relocated in 1907. Several additional residences were also moved during this period, and by 1926 only a single unoccupied house remained at the old settlement (Harrington, 1998a).

A post office serving the new Town of Gay Head was established in 1873 and operated out of a succession of private residences, including the Linus S. Jeffers Residence, throughout its roughly 70-year existence. The Post Office/Residence at 980 State Road was likely constructed in the 1920s as a seasonal gift shop and served as the post office and postmistress' residence from the 1930s until the post office was closed during the Second World War. The building presumably continued to serve as a residence following the post office's closure; however, by the late 1990s, the building had been vacant for some time (Harrington, 1998a).

There were no purpose-built town offices in Gay Head until 1929 when the current Town Hall was constructed. Previously, town meetings had been held in the school and town officials rented space in the nearby Linus S. Jeffers residence, which also served as a grocery store and town post office. Linus Jeffers served on the Board of Directors of the Gay Head Improvement Association, which raised funds for the construction of the new Town Hall. The building was designed by Vineyard Haven architect Herbert C. Hancock. Since its construction, the building has housed many of the town's social gatherings since it has the largest capacity of any buildings within the town (Harrington, 1998a).

The year-round (primarily Wampanoag) population declined during the twentieth century as communal economic systems dependent on fishing and agriculture waned. Meanwhile, visitation from off-island increased dramatically, and many new residences were constructed for use as summer rentals or vacation homes. A group of cottages known as the Totem Pole Inn was built during this period just east of the intersection of State Road and Church Street. Gay Head's town center continued to grow in order to meet the changing community's needs. The town was without a dedicated fire department until the fire station was constructed to the east of the Town Hall in about 1959 or 1960; it is still in use today. The town's library was shuffled back and forth between the school and the Town Hall multiple times over several decades before the school closed in 1968 and the town's children began attending larger schools in Chilmark and Vineyard Haven. In 1975, the school was used as additional town office space while a substantial addition was made to the Town Hall. In the same year, the school was permanently converted into the town library and it continues to serve that function today. In the late 1980s, the town once again was in need of additional office space, and a new town office building was built east of the existing Town Hall. Additional alterations were made to the 1975 addition in 1992-1993 to house the town police barracks. The town's name was changed from Gay Head to its Wampanoag name, Aquinnah, in 1998 (Harrington, 1998a).

In general, the buildings comprising the Gay Head – Aquinnah Town Center Historic District continue to be utilized by the community for their original purposes. While the Aquinnah Public Library no longer functions as a school, it continues to be a center of activity and is well cared for by the community. A large deck and accessible ramp were recently added to the building. The Town Hall has likewise undergone maintenance and repairs in recent years. The Gay Head Community Baptist Church is the only extant church building in the Town of Aquinnah. The Post Office/Residence remains vacant. The Gay Head – Aquinnah Town Center Historic District was listed in the NRHP in 1999 (nomination completed in 1998) and in 2001, the boundary was increased to include an additional 17 contributing buildings and three noncontributing buildings (Harrington and Friedberg, 2001).

3.9.3 NRHP/NHL Criteria and the Maritime Visual Setting

The Gay Head – Aquinnah community's historic relationship with and dependence upon maritime resources is integral to understanding the history and development of the historic district. The Gay Head – Aquinnah Town Center Historic District meets National Register Criteria A and C in the areas of architecture, community planning, and Native American ethnic heritage as an intact group of civic, residential, and religious buildings representing nineteenth- and twentieth-century settlement in the Town of Gay Head. The district's period of significance is circa 1850 (the construction date of the earliest building in the district, the Aquinnah Public Library) to 1951 (50 years prior to the NRHP boundary expansion in 2001; Harrington and Friedberg, 2001). The fire station was not included in the 1998 NRHP nomination because it had not yet reached 50 years of age; however, it retains a high degree of integrity and could be considered a contributing resource to the historic district. Although the library, church, and parsonage have been relocated from their original sites, they meet Criteria Consideration B because their relocation took place during the period of significance and was directly related to the growth of the town center and shifts in development patterns in the late nineteenth and early twentieth centuries. The district is sited on the elevated highlands of a prominent moraine. The surviving ocean views are important surviving elements of a once-more expansive pastoral maritime setting for the district.

3.10 Gay Head – Aquinnah Shops

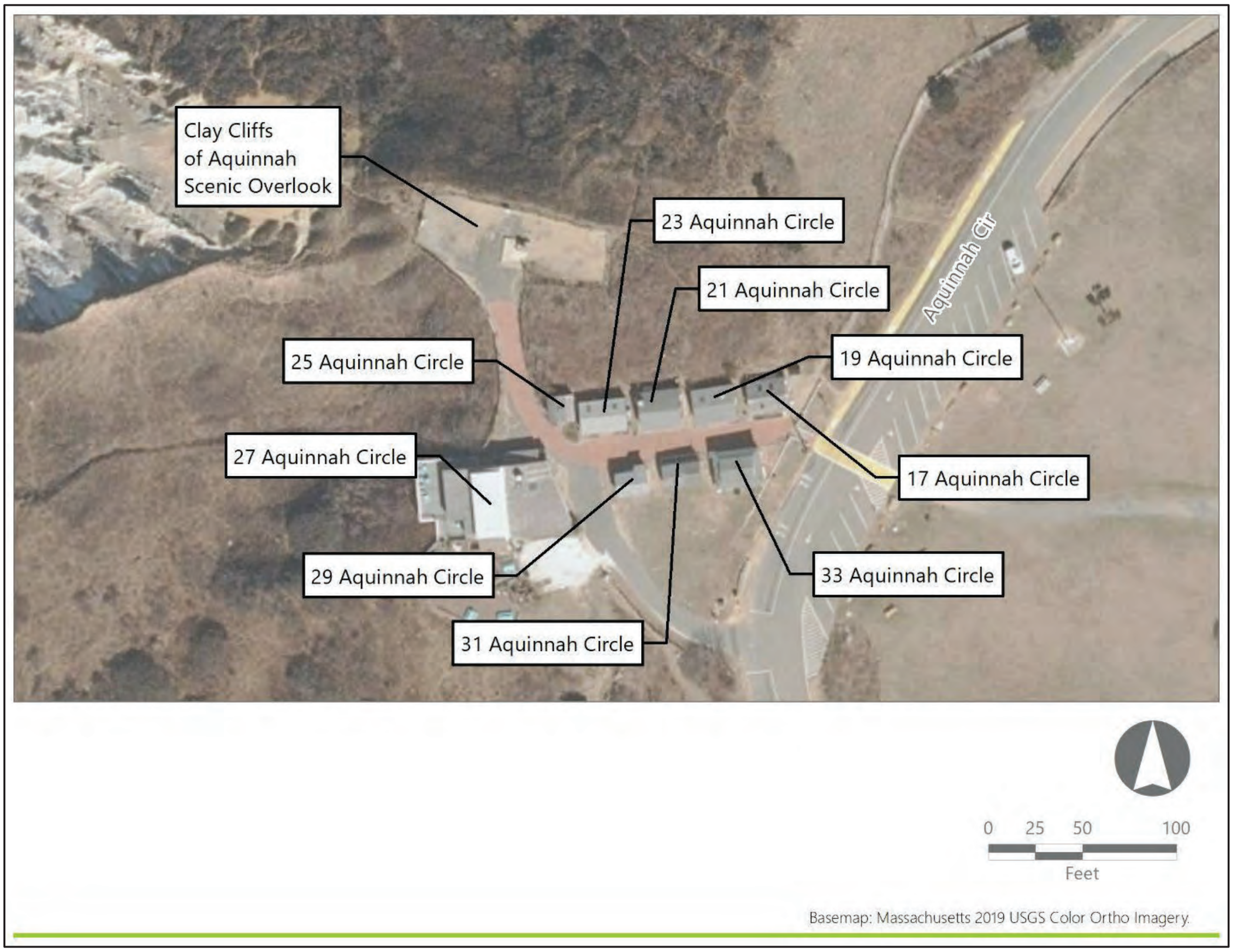
3.10.1 Physical Description and Existing Conditions

The Gay Head – Aquinnah Shops are a group of nine vernacular commercial buildings clustered around a paved walkway leading from a parking area along Aquinnah Circle to the Clay Cliffs of Aquinnah Scenic Overlook (see Figure 3.1-1). All buildings are of similar scale, form, and materials, generally consisting of simple rectangular volumes with gable or hipped roofs and wood-shingle siding. The buildings are sited on two tax parcels comprising approximately 4.8 acres, which comprise the entirety of the Property. The buildings occupy limited portions of the parcels, leaving large areas of open space consisting of low-growing vegetation.

The brick paved walkway which forms the central spine of the Property is accessed from Aquinnah Circle via a short flight of concrete stairs with painted wood handrails. From east to west, the buildings north of the walkway are numbered 17, 19, 21, 23 and 25 Aquinnah Circle. The buildings south of the walkway, from east to west, are numbered 33, 31, 29, and 27 Aquinnah Circle. The westernmost building, 27 Aquinnah

Circle, is separated from the other buildings by an asphalt vehicle access drive which functions as an alternative, stair-free path to the overlook.

Figure 3.10-1. Aquinnah Shops Site Map



Existing conditions and alterations since the Gay Head – Aquinnah Shops were documented in 1998 (Harrington, 1998) are described for each building:

- The building at 17 Aquinnah Circle (circa 2005) is a single-story building with a rectangular footprint, a moderately pitched gable roof clad in wood shingles, and exterior wood shingle wall cladding. The primary (south) elevation features a centered two-leaf entry door flanked by small windows. This entry is accessed by a wood ramp. The east elevation has a secondary entrance. The building does not appear in aerial imagery dated to 2001 and appears to have been completely rebuilt in approximately 2005 (Harrington, 1998b; MassGIS, 2001, 2005).
- The building at 19 Aquinnah Circle (early- to mid-twentieth century) is a single-story building with a rectangular footprint, a low gable roof clad in asphalt shingles, and exterior wood shingle wall cladding. The primary (south) elevation has a deep eave overhand and features a centered two-leaf

entry door flanked by paired one-over-one windows. The entry is raised three steps from the paved walkway. The doors and windows have been replaced since 1998 but retain their approximate size and position (Harrington, 1998b).

- The building at 21 Aquinnah Circle (circa 2005) is a single-story building with a rectangular footprint, a low gable roof clad in asphalt shingles, and exterior wood shingle wall cladding. The primary (south) elevation has three pairs of sliding service windows sheltered by an open porch. The building appears to have been completely rebuilt in approximately 2005 and does not appear in aerial imagery dated to 2001 (Harrington, 1998b; MassGIS, 2001, 2005).
- The building at 23 Aquinnah Circle (circa 1950s) is a single-story building with a rectangular footprint, a low gable roof clad in asphalt shingles, and exterior wood shingle wall cladding. The primary (south) elevation features a centered two-leaf entry door flanked by large windows. The entry is raised two steps form the paved walkway. The south elevation windows were replaced after 1998, when they consisted of paired three-light casement windows (Harrington, 1998b).
- The building at 25 Aquinnah Circle (circa 2013) is the smallest of the Gay Head – Aquinnah Shops buildings and is set back farther from the walkway than 17-23 and 29-33 Aquinnah Circle. It is a single-story building with an approximately square footprint, a low gable roof clad in wood shingle, and exterior wood shingle or bark wall cladding. It has been completely rebuilt since 1998 and does not appear in aerial imagery dated to 2011-2012 (Harrington, 1998b; MassGIS, 2011-2012, 2013-2014).
- The building at 27 Aquinnah Circle (mid-twentieth century) is the largest of the Gay Head – Aquinnah Shops buildings and occupies a separate tax parcel from the rest of the shops. It is a one-and-one-half-story building with a roughly rectangular footprint, a low gable roof clad in asphalt shingle, and exterior wood shingle wall cladding. It has two small shed additions and a shed dormer. The primary (east) elevation has an entrance within an inset porch and a pair of sliding service windows. The building houses a restaurant with indoor and outdoor seating areas, including a large wood deck and concrete patio. It does not appear to have been altered significantly since 1998 (Harrington, 1998b).
- The building at 29 Aquinnah Circle (circa 2015) is a single-story building with a rectangular footprint, a low gable roof clad in asphalt shingle, and exterior wood shingle wall cladding. It has been completely rebuilt since 1998 and does not appear in aerial imagery dated to 2015 (Harrington, 1998b; Town of Aquinnah, 2022).
- The building at 31 Aquinnah Circle (mid-twentieth century; rebuilt or enlarged circa 2008) is a single-story building with a rectangular footprint, a low gable roof clad in asphalt shingles, and exterior wood shingle wall cladding. The primary (north) elevation has double leaf, nine-light wood entry doors and a large fixed-sash window. The entry is raised two steps from the paved walkway. The building has been enlarged (or rebuilt) and the north elevation has been altered since 1998, when the entry doors were centered and flanked by two small windows (Harrington, 1998b; MassGIS, 2005, 2008).
- The building at 33 Aquinnah Circle (circa 1950s; possibly rebuilt circa 2000) is a single-story building with a rectangular footprint, a gable-on-hip roof clad in asphalt shingles, and exterior wood shingle wall cladding. The primary (north) elevation has four service windows. A single-light door and a

large window are located on the east elevation. The building has been substantially altered or possibly rebuilt since 1998, when it had a hipped roof and an inset porch with a door on the north elevation (Harrington, 1998b; MassGIS, 1990s, 2001).

The buildings were observed to be in fair to good condition when they were documented in 1998 (Harrington, 1998b). The apparent rebuilding or substantial remodeling of six of the buildings since that date, as well as the replacement of many of the remaining buildings' windows and doors, is likely due to the buildings' ongoing exposure to harsh seaside conditions.

3.10.2 Historic Context

The Aquinnah Cliffs and Gay Head Light have been a tourist attraction since the nineteenth century. Several small shops and "tepees" catering to tourists were present along the cliffs by the early twentieth century but were relocated to the present site by the Town of Gay Head (now, the Town of Aquinnah) in order to preserve the setting of the overlook. The earliest extant building on the site was built in the early-to-mid-twentieth century, while the remaining buildings are believed to have been constructed from the mid-twentieth century to the early twenty-first century. The form, scale, and materials of the buildings have been consistent with the vernacular building traditions of coastal New England: modest in size, with low-to-moderate gable roofs, shallow roof eaves, simple doors and windows, and shingle cladding. Historically, the shops sold souvenir items including Wampanoag crafts and objects made from the local clay (Harrington, 1998b).

The Gay Head Cliffs, comprising 24 acres under municipal and Wampanoag trust ownership, were designated as a National Natural Landmark by the National Park Service in 1965 (NPS, 2021). Gay Head Cliffs, including the Gay Head – Aquinnah Shops, was designated as a District of Critical Planning Concern by the Martha's Vineyard Commission (Dukes County). Construction within the district is subject to limitations in order to preserve the natural, ecological, cultural, and historic resources of the district (Town of Aquinnah, 2022). The Gay Head – Aquinnah Shops were surveyed by the Massachusetts Historical Commission in 1998. The same year, the name of the town and its namesake cliffs were changed from Gay Head to Aquinnah, their original Wampanoag name.

Today, the buildings are used primarily as seasonal restaurants and gift shops catering to the tourists who visit the Clay Cliffs of Aquinnah Scenic Overlook. Many of the businesses are multigenerational family enterprises owned by members of the Wampanoag Tribe of Gay Head (Aquinnah). As of 2015, tribal members had the right of first refusal to lease the building lots from the Town of Aquinnah (Elvin, 2015). The buildings now appear to be under a mix of individual and tribal ownership (Town of Aquinnah, 2022).

3.10.3 NRHP/NHL Criteria and the Maritime Visual Setting

As a historic district, the Gay Head – Aquinnah Shops meet National Register Criterion A for their association with the development of Aquinnah Cliffs as a tourist attraction during the late nineteenth and early twentieth centuries. The district also meets Criterion C as a group of intact twentieth-century commercial buildings in keeping with the characteristic scale, form, and materials of the vernacular building tradition of coastal New England. The natural landscape and maritime visual setting of the Aquinnah Cliffs, including expansive views of the Atlantic Ocean, are key to understanding the Gay Head-Aquinnah Shops' historic significance as a commercial development directly tied to seaside tourism.

3.11 Gay Head – Aquinnah Coast Guard Station Barracks

3.11.1 Physical Description and Existing Conditions

The Gay Head – Aquinnah Coast Guard Station Barracks is currently located at 1147 State Road. The building is a one-and-a-half-story residential building set on a high stone foundation with stone support piers. The building is clad in wood shingles and two shed dormers are located on the north and south rooflines. A small, one-story addition is located to the east.

3.11.2 Historic Context

The building's exact construction date is unknown; however, it was originally a barracks located at the Coast Guard Station near the Gay Head Light. In 1870, South Road was constructed, and multiple buildings were relocated to the new roadway. According to the MHC Form, the Gay Head – Aquinnah Coast Guard Station Barracks was moved to its present location after World War II and was converted to a residence (Harrington, 1998g).

3.11.3 NRHP/NHL Criteria and the Maritime Visual Setting

As stated above, the Gay Head – Aquinnah Coast Guard Station Barracks was relocated from its original location, thus affecting its integrity of setting; however, the building retains its integrity of materials, workmanship, association, and design. The building is eligible for listing under Criterion A for its association with the United States Coast Guard Station in Aquinnah.

Although the Gay Head - Aquinnah Coast Guard Station Barracks was relocated from its original maritime setting, the building is currently sited on an elevated parcel of land with ocean views.

4.0 MITIGATION MEASURES

Mitigation measures at these historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Funding for Historic Preservation and Climate Adaptation Planning

4.1.1 Purpose and Intended Outcome

The 2021 *Dukes County Multi-Jurisdiction Hazard Mitigation Plan Update* identifies the reduction in loss or damage to cultural resources, including the eight historic properties identified in this HPTP, from natural hazards as an overall hazard mitigation goal (MVC, 2021). Identification of historic preservation priorities and goals within the Town and County's hazard plan and long-range climate adaptation measures will help preserve the character and setting of historic resources within the Town of Aquinnah while addressing anticipated threats to historic resources and their setting from climate change.

This HPTP proposes funding for the development of a Historic Preservation and Climate Adaptation Plan for the Town of Aquinnah which will include public engagement to identify historic preservation and climate adaptation priorities and concerns of the local community.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review existing town and county planning documents and regulations;
- Conduct public outreach in order to identify historic preservation priorities and concerns;
- Photograph and document (e.g. map) existing conditions;
- Draft a historic preservation and climate adaptation plan for distribution to the Participating Parties for review and comment;
- Develop a final plan to include comments from the Participating Parties; and
- Distribute the final plan to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the Scope of Work listed in Section 4.1.2. The chosen consultant should have a demonstrated knowledge of climate change and the treatment of historic properties. Public engagement sessions will be held to solicit comments, questions, and concerns from the residents of the Town of

Aquinnah. The sessions will inform the preparation of the draft plan which will be distributed to the Participating Parties for review and comment. Additional sessions should be held as necessary to allow for public engagement. The comments shall be addressed and incorporated in the final document which will be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with the following standards:

- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- Martha's Vineyard Commission's planning and climate change guidance, as applicable;
- Town of Aquinnah Community Preservation Committee guidance, as applicable;
- Town of Aquinnah Planning Bard Review Committee guidance, as applicable; and
- Town of Aquinnah Energy and Climate Committee guidance, as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Photography and documentation (e.g., mapping);
- Preliminary draft of the historic preservation and climate adaptation plan, including photographs and maps; and
- Final plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Funding for Energy Efficiency Improvements to the Town Hall

4.2.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to fund energy efficiency improvements to the Town Hall, a contributing resource to the Aquinnah Town Center Historic District. During Revolution Wind's Stakeholder Meeting with the Martha's Vineyard Commission to discuss this draft HPTP on February 1, 2022, the Martha's Vineyard Commission stated that energy efficiency and preservation of the Aquinnah Town Hall are important priorities. The intended outcome of this HPTP is to increase the energy efficiency and to help ensure the long-term preservation of this historic property.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Review existing town and county planning documents and regulations;
- Review existing energy efficiency guidance, including resources from the National Park Service's Technical Preservation Services and the National Trust for Historic Preservation;
- Photograph and document (e.g., map) existing conditions;
- Develop draft plans and specifications;
- Consult with Participating Parties;
- Develop draft plans and specifications to be distributed to the Participating Parties for review and comment;
- Develop a final plans and specifications to include comments from the Participating Parties;
- Distribute the final plans and specifications to the Participating Parties;
- Implement the improvements; and
- Develop as-built documentation to be distributed to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release an RFP for consultant and contracting services for the scope of work and select a consultant to perform the Scope of Work listed in Section 4.2.2. The preferred consultants and contractors will have experience in developing energy efficiency plans for historic buildings. The draft and final plans and specifications will be developed in consultation with the Participating Parties.

4.2.4 Standards

The project will comply with following standards:

- The Town of Aquinnah Building Code, as applicable;
- The Town of Aquinnah Energy and Climate Committee guidance, as applicable;
- The Secretary of the Interior's Standards for Rehabilitation (36 CFR 67.7); and
- National Park Service's *Improving Energy Efficiency in Historic Buildings* Preservation Brief 3.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP.
- Preliminary draft plans and specifications;
- Final plans and specifications; and
- As-built documentation including photographs.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Complete Identified Needs from the Americans with Disabilities Act (ADA) Compliance Plan

4.3.1 Purpose and Intended Outcome

The Aquinnah Circle and the Gay Head – Aquinnah Shops Area is identified in the Town of Aquinnah's 2019 *Community Preservation Committee Plan* as important to Wampanoag Tribe of Gay Head (Aquinnah) members, town residents, and visitors (Town of Aquinnah, 2019). The purpose of this mitigation measure is to complete the next phase of work identified in the proposed Americans with Disabilities Act (ADA) Compliance Plan for the Aquinnah Circle and the Gay Head – Aquinnah Shops Area (the ADA Compliance Plan) which is expected to be completed in the near future. The intended outcome of this measure is to ensure all visitors are able to access and enjoy the Gay Head – Aquinnah Shops. Revolution Wind discussed this proposed measure at the stakeholder meeting on February 18, 2022.

4.3.2 Scope of Work

The scope of work will consist of the following:

- Review the ADA Compliance Plan;
- Photograph and document existing conditions;
- Consult with Participating Parties;
- Develop draft plans and specifications to be distributed to the Participating Parties for review and comment;
- Develop final plans and specifications to include comments from the Participating Parties;
- Distribute the final plans and specifications to the Participating Parties;
- Implement the improvements; and
- Develop as-built documentation to be distributed to the Participating Parties.

4.3.3 Methodology

Revolution Wind will release an RFP for consultant and contracting services for the scope of work and select a consultant to perform the Scope of Work listed in Section 4.3.2. The preferred consultants and contractors will have experience in ADA Compliance and historic properties. The draft and final plans and specifications will be developed in consultation with the Participating Parties. Prior to any work, existing condition documentation, including photographs will be completed and distributed to the Participating Parties. The project will be implemented according to the final plans. At the completion of the project, as-built documentation, including photographs will be distributed to the Participating Parties.

4.3.4 Standards

The rehabilitation will comply with the following standards:

- Town of Aquinnah, MA Building Code, as applicable;
- Martha's Vineyard Commission's planning guidance, as applicable;
- ADA;
- The Massachusetts Office on Disability Guidelines as applicable; and
- The Secretary of the Interior's Standards and Guidelines for Rehabilitation (36 CFR 68).

4.3.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Photographs and documentation of existing conditions;
- RFPs;
- Proposals by qualified consultants in response to the RFP.
- Preliminary draft of the construction plans including schedule, cost, and specifications to be distributed to the Participating Parties;
- Final construction plan to be distributed to the Participating Parties; and
- As-built documentation including photographs.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30 days to review and comment on all draft reports or other work products developed for this

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[3] The timeline is subject to change and is based on current available information.

HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required:

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah Historic Properties, February 1, 2022; and
- Follow-up to the Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah Historic Properties, February 1, 2022 with the Martha's Vineyard Commission, March 18, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 14 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE GAY HEAD LIGHTHOUSE, TOWN OF AQUINNAH, DUKES COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 14 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Scrubby Neck Schoolhouse
Town of West Tisbury, Dukes County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Gay Head Lighthouse

Town of Aquinnah, Dukes County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Gay Head Lighthouse
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
SOI	Secretary of the Interior
USCG	United States Coast Guard
VERI	Vineyard Environmental Research Institute
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Gay Head Lighthouse, which is listed on the National Register of Historic Places (NRHP) (the Historic Property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

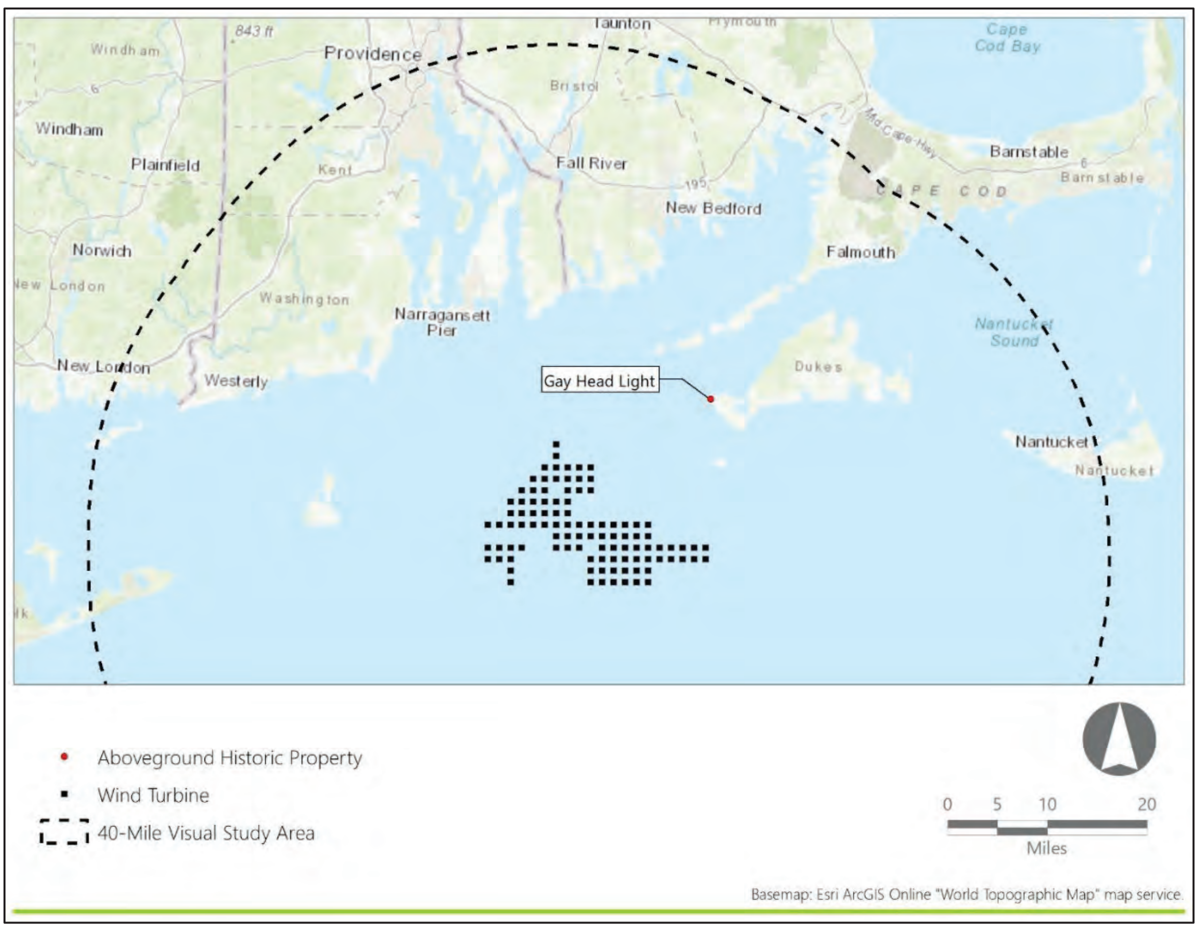
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historical commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The State of Massachusetts preservation restrictions are outlined in Massachusetts General Law Chapter 184, Sections 31-33. The Massachusetts Historical Commission (MHC) holds a Historic Preservation Restriction and the United States Coast Guard (USCG) holds an Aid to Navigation Easement on the historic property per 10 USC 2668 Easements for Rights of Way. Any mitigation work associated with the historic property will comply with the conditions of all extant historic preservation easements. Additional information regarding compliance with extant preservation restrictions appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Wampanoag Tribe of Gay-Head Aquinnah
- The Martha’s Vineyard Commission
- The Gay Head Lighthouse Advisory Committee
- The Town of Aquinnah
- The Massachusetts Historical Commission.[2]

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM’s Section 106 consultation process.

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

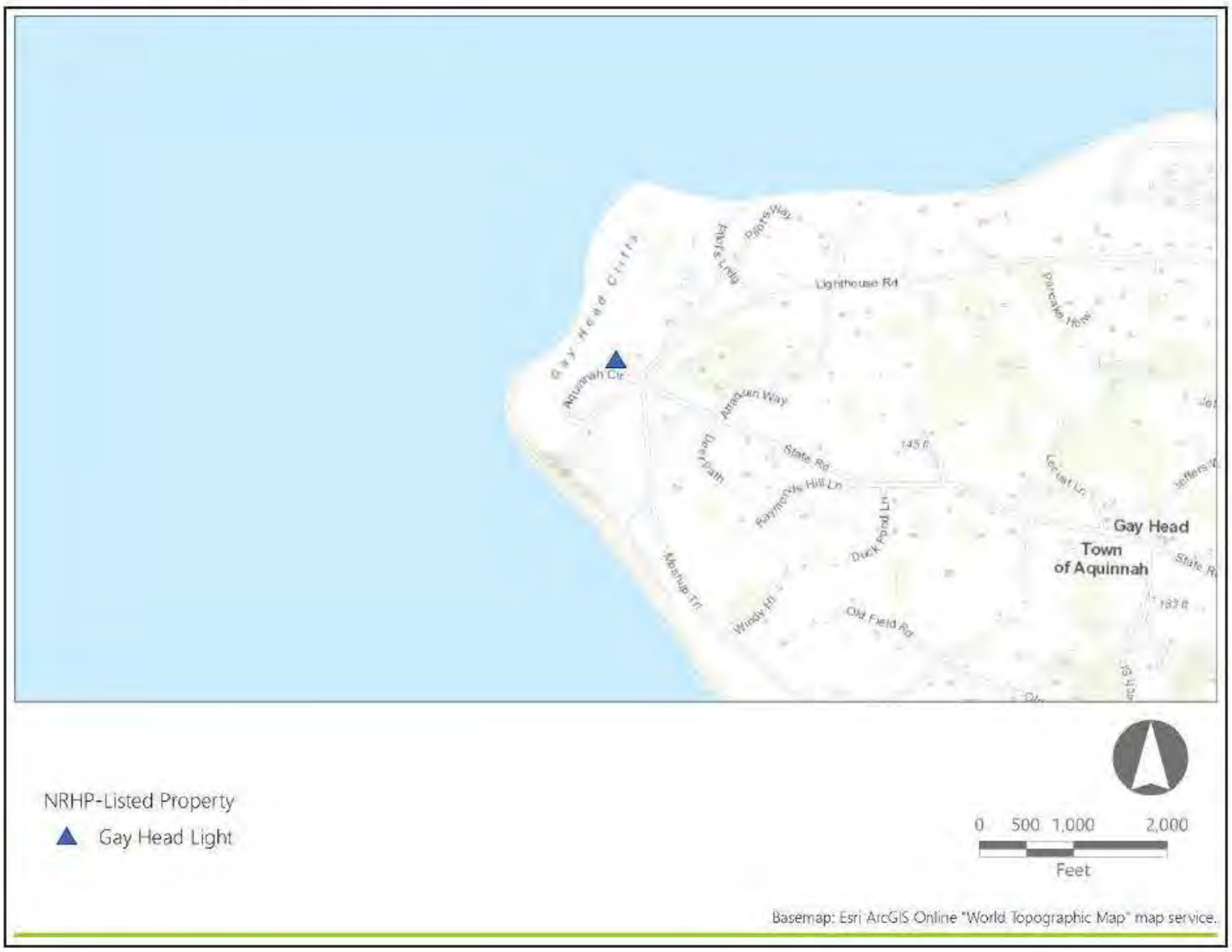
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
The Gay Head Lighthouse	NRHP-Listed	Town of Aquinnah	MA	MHC #GAY 900 (MHC); GSA 1-X-MA-0877 (USCG); 87001464 (NPS)	Public	Lighthouses and Navigational Aids

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The Gay Head Lighthouse is considered within the HRVEA as historic property type "Lighthouses and Navigational Aids" which is defined by the historic associations with water-related transportation and defense, prominent views of the sea and dominance of the surrounding landscape, and common architectural forms. These structures present themselves as prominent and iconic features on the coastal landscape, possess elevated views of the ocean horizon, and are sited specifically for those elevated views.

Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid.

3.3 The Gay Head Lighthouse

3.3.1 Physical Description and Existing Conditions

Sited on 1.35 acres off Aquinnah Circle at the southwestern point of the Town of Aquinnah, the conical 1856 brick lighthouse sits just east of clay cliffs which overlook Devil's Bridge rocks. The lighthouse marks the entrance to Vineyard Sound from the south. In 2015, the structure was relocated 134 feet from its original location, away from the cliffs due to erosion concerns (Gay Head Lighthouse, 2018). The structure was placed on a new granite sub-foundation, at the same elevation as its original location (Unnamed, 2015).

The red brick tower shaft houses interior stairs and measures 17.5 feet in diameter and 45.7 feet in height (DiStefano, 1981). A mid-level balcony, corresponding to the interior lamp room, rests on a sandstone entablature and has iron railings. The glazed lens room with black iron structure contains the optic and sits atop the masonry with its own iron balcony (Tait, 1987). The lens room is enclosed by an iron roof with ventilator and lightning rod. A series of square four-pane windows perforate the building envelope at various heights around the circumference of the lighthouse. Recent improvements include replacement iron railings that match the original set, and repair to masonry damage where the lens room and balcony meet the brick (Gay Head Lighthouse, 2018).

Following the relocation of the Gay Head Lighthouse in 2015, cliff erosion was no longer the biggest threat to the structure. Due to age and maritime siting, the poor condition of the Gay Head Lighthouse building materials is currently posing the largest risk to its long-term survival. The curtain wall of the lens room, as well as brick, sandstone, and mortar all display signs of deterioration (Gay Head Lighthouse, 2018).

3.3.2 Historic Context

The extant circa 1856 Gay Head Lighthouse is the second lighthouse on this site, a replacement for the original wood structure authorized in 1799 by President John Adams (DiStefano, 1981). By 1854, the original structure was being confused with the Sankay Light on Nantucket, resulting in a shipwreck. As a response to the tragedy, Congress allocated $30,000 for a new brick lighthouse, a first-order Fresnel lens from France, and a keeper's residence (demolished circa 1961). Caleb King of Boston constructed the new Gay Head Lighthouse and keeper's house using brick from the nearby Chilmark Brick Works. The lighthouse's reopening in 1856 was well publicized and tours opened to the public shortly thereafter (Gay Head Lighthouse, 2018).

Between 1856 and 1952 the Fresnel lens served as the lighthouse beacon, under the care of 18 principal keepers and 10 assistant keepers. The first Wampanoag Tribe of Gay Head (Aquinnah) member to serve as the Gay Head Lighthouse Keeper was Charles W. Vanderhoop, Sr. who served in that position from 1930-1933 (Gay Head Lighthouse, 2018). Following the introduction of electricity and an upgraded optic at the lighthouse, the USCG donated the Fresnel lens to the Martha's Vineyard Museum, and the keeper's house was demolished. With a fully automated beacon, the USCG began its operation of the Gay Head Lighthouse in 1956.

Under USCG stewardship, and with insufficient funds for maintenance, the condition of the Gay Head Lighthouse began its slow decline in the 1960s, continuing into the early 1980s. In 1984, Congressional hearings to save the Gay Head Lighthouse from demolition resulted in the licensure of a 35-year lease to the Vineyard Environmental Research Institute (VERI) who were given control of the management and maintenance of the property (Gay Head Lighthouse, 2018). The USCG continued to operate the navigational aid beacon through an access easement (see Section 2.2.2). VERI commenced fundraising activities to make repairs and re-open the lighthouse to the public, which was done in 1986, 30 years after its closure. Once again keepers and assistant keepers were appointed, including Charles Vanderhoop, Jr. who was born in the keeper's house. In 1994, VERI transferred its license to the Martha's Vineyard Museum, and in 2009 the Museum provided President Barack Obama a private tour of the property with his family (Gay Head Lighthouse, 2018).

Though cliff erosion was a decades-old problem at the Gay Head Lighthouse, it became an increased threat in 2010 when a portion of the perimeter fence tumbled down the cliff face. By 2012, the Save the Lighthouse Committee was formed to research options for the continued safety of the structure, including a potential relocation which was determined to be the solution. In 2013, the Gay Head Lighthouse was featured on the National Trust of Historic Preservation's list of 11 Most Endangered Places. Its inclusion on the list put in motion a years-long fundraising campaign for its relocation by International Chimney Corporation who recommended it occur no later than 2015. With funding in place, the move began on May 28, 2015, and finished on May 30, 2015, with the Gay Head Lighthouse's safety assured for another century (Gay Head Lighthouse, 2018).

The Town of Aquinnah filed for ownership of the property in 2015, as it was determined to be excess to the needs of the UCSG (General Services Administration, 2013). The deed to the town included a preservation easement and access restrictions, described in Section 2.2.2. The Gay Head Lighthouse Advisory Committee is a municipal department board which manages the property.

3.3.3 NRHP Criteria and the Maritime Visual Setting

In 1987, the Gay Head Lighthouse was listed on the NRHP as part of the Lighthouses of Massachusetts Thematic Resources Area (DiStefano, 1981). At the time of construction, it was considered one of the ten most important lights on the Atlantic Coast and contained one of the country's first Fresnel lenses. The Gay Head Lighthouse is significant under Criterion A as a historic maritime structure and aid to navigation. It is also significant under Criterion C as an outstanding example of nineteenth-century maritime architecture (Tait, 2017).

The site chosen for the lighthouse's 2015 relocation was consistent with the setting of the original, thereby allowing for the continued integrity of "association, setting, feeling and relationship to the Gay Head cliffs and to the ocean as an aid to navigation" (Unnamed, 2015). Therefore, the Gay Head Lighthouse continued to be NRHP-listed during and following its relocation. Since that time, physical improvements have been consistent with the Secretary of the Interior's (SOI) Standards (36 CFR 68) which have allowed the structure to retain integrity of materials, workmanship, and design.

As stated above, the Gay Head Light is located on the Gay Head Cliffs and "marks the Devil's Bridge rocks, the shoals of the south shore of the island and the entrance to Vineyard Sound from Buzzard's Bay" (Tait, 2017). Devil's Bridge extends over a mile from the cliffs and has been the site of numerous accidents. In 1838 the lighthouse was replaced, and the new light could be seen for more than 20 miles (D'Entremont, 2021). The need for a lighthouse at this location is evident, and despite the powerful and long-distance light, due to Devil's Bridge and the strong currents, shipwrecks continued to occur. The setting of the Gay Head Light is intrinsically linked to the water with its location high on the Gay Head Cliffs, marking Vineyard Sound and the Atlantic Ocean.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Rehabilitation of the Gay Head Lighthouse

4.1.1 Purpose and Intended Outcome

In consultation with the Town of Aquinnah and the Gay Head Lighthouse Advisory Board, this mitigation measure will help fund the next phase of rehabilitation at the Gay Head Lighthouse. As discussed at the Revolution Wind stakeholder meetings on February 1, 15 and 18, 2022. The Gay Head Lighthouse Advisory Board, a municipal board in the Town of Aquinnah, has commissioned a report identifying preservation and restoration needs for the lighthouse. The intended outcome 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 the report.

4.1.2 Scope of Work

The scope of work will be determined by the previously referenced report and in consultation with the Participating Parties. Prior to any work commencing, photographic and written documentation of the existing conditions will be recorded.

4.1.3 Methodology

Revolution Wind will release a request for proposals for consultant services and select a consultant to perform the scope of work. Drawings and specifications supporting the scope of work (see Section 4.1.2) will be developed in compliance with applicable standards (see Section 4.1.4). The project will require the mobilization of a qualified contractor that is experienced in the repair and restoration of historic lighthouses.

4.1.4 Standards

The scope of work will comply with following standards:

- Town of Aquinnah, MA Building Code;
- Martha's Vineyard Commission planning guidance, as applicable;
- Preservation Restriction (MGL Chapter 184, Section 31-33);

- United States Coast Guard Aid to Navigation (ATON) Access Easement (U. S. Department of Homeland Security and U. S. Coast Guard, 2005);
- The Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations;
- The Town of New Shoreham Historic District Commission;
- United States Coast Guard Aid to Navigation (ATON) Access Easement (U. S. Department of Homeland Security and U. S. Coast Guard, 2005);
- *Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* (Nelson, 1988);
- *Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings;*
- *National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation;*
- *Historic Lighthouse Preservation Handbook;*
- *IALA-AISM Lighthouse Conservation Manual;*
- Preservation Restriction (RIGL Title 42, Section 42-45-9); and
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68); and
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- Proposed scopes of work including draft text, project plans, and design specifications;
- Photographic and written documentation of existing conditions;
- Draft specifications and construction drawings to be distributed to the Participating Parties for review and comment;
- Final Specifications and construction drawings to be distributed to the Participating Parties for review and comment; and
- A Summary Report of the work completed including photographs and as-built documentation to be distributed to the Participating Parties.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Massachusetts Historical Commission (MHC)

The scope of work will be submitted to the MHC under the terms of the Preservation Restriction.

5.2.4 Massachusetts State Historic Preservation Officer

The scope of work will be submitted to the Massachusetts State Historic Preservation Officer for compliance with the SOI Standards for Rehabilitation (36 CFR 68).

5.2.5 United States Coast Guard (USCG)

The scope of work will be submitted to the USCG for review to confirm that it complies with the terms of the ATON Access Easement.

5.2.6 Wampanoag Tribe of Gay Head (Aquinnah)

The Wampanoag Tribe of Gay Head (Aquinnah) may, at their sole discretion, participate in consultations for the development and finalization of the HPTP in recognition of the traditional cultural and religious significance of the historic property to the Tribe.

5.2.7 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah, February 1, 2022;
- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Gay Head Lighthouse, February 15, 2022;
- Follow-up to the Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah Historic Properties, February 1, 2022, with the Martha's Vineyard Commission, March 18, 2022; and
- Follow-up to the Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah, July 1, 2022 with the Martha's Vineyard Commission, March 18, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 15 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: CAPT. SAMUEL HANCOCK – CAPT. WEST MITCHELL HOUSE, RUSSELL HANCOCK HOUSE, RUSSELL HANCOCK HOUSE, ERNEST FLANDERS HOUSE, BARN, AND SHOP, SIMON MAYHEW HOUSE, ERNEST FLANDERS HOUSE, BARN, AND SHOP, AND FLAGHOLE, TOWN OF CHILMARK, DUKES COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 15 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Capt. Samuel Hancock - Capt. West Mitchell House
Russell Hancock House
Ernest Flanders House, Shop, and Barn
Simon Mayhew House
Flaghole
Town of Chilmark, Dukes County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Capt. Samuel Hancock - Capt. West Mitchell House Russell Hancock House Simon Mayhew House Flaghole Ernest Flanders House, Shop, and Barn
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NRHP	National Register of Historic Places
RFP	Request for Proposals
ROD	Record of Decision
RWEC	Revolution Wind Export Cable

RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft, applicant-proposed Historic Property Treatment Plan (HPTP) for the Capt. Samuel Hancock - Capt. West Mitchell House, which was determined by the Massachusetts Historical Commission (MHC) to be eligible for listing on the National Register of Historic Places (NRHP); Russell Hancock House, which is a MHC Historic Inventory Property; Simon Mayhew House, which is a MHC Historic Inventory Property; Flaghole, which is a MHC Historic Inventory Property; and the Ernest Flanders House, Shop and Barn, which is a MHC Historic Inventory Property, (the historic properties), provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (the Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

[1] The timeline is subject to change and is based on current available information.

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder

engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

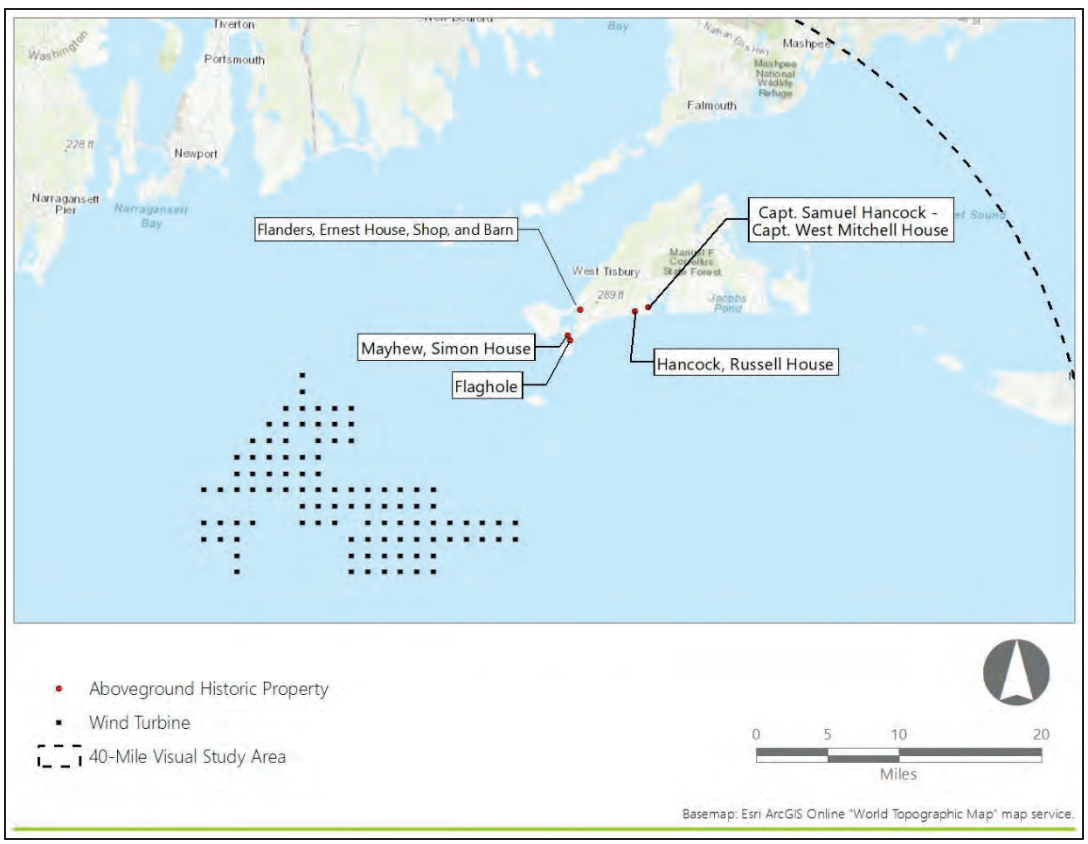
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Chilmark
- The Martha's Vineyard Commission
- The Massachusetts Historical Commission.[2]

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

Revolution Wind anticipates these parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS,HISTORIC SIGNIFICANCE, AND MARITIME SETTING

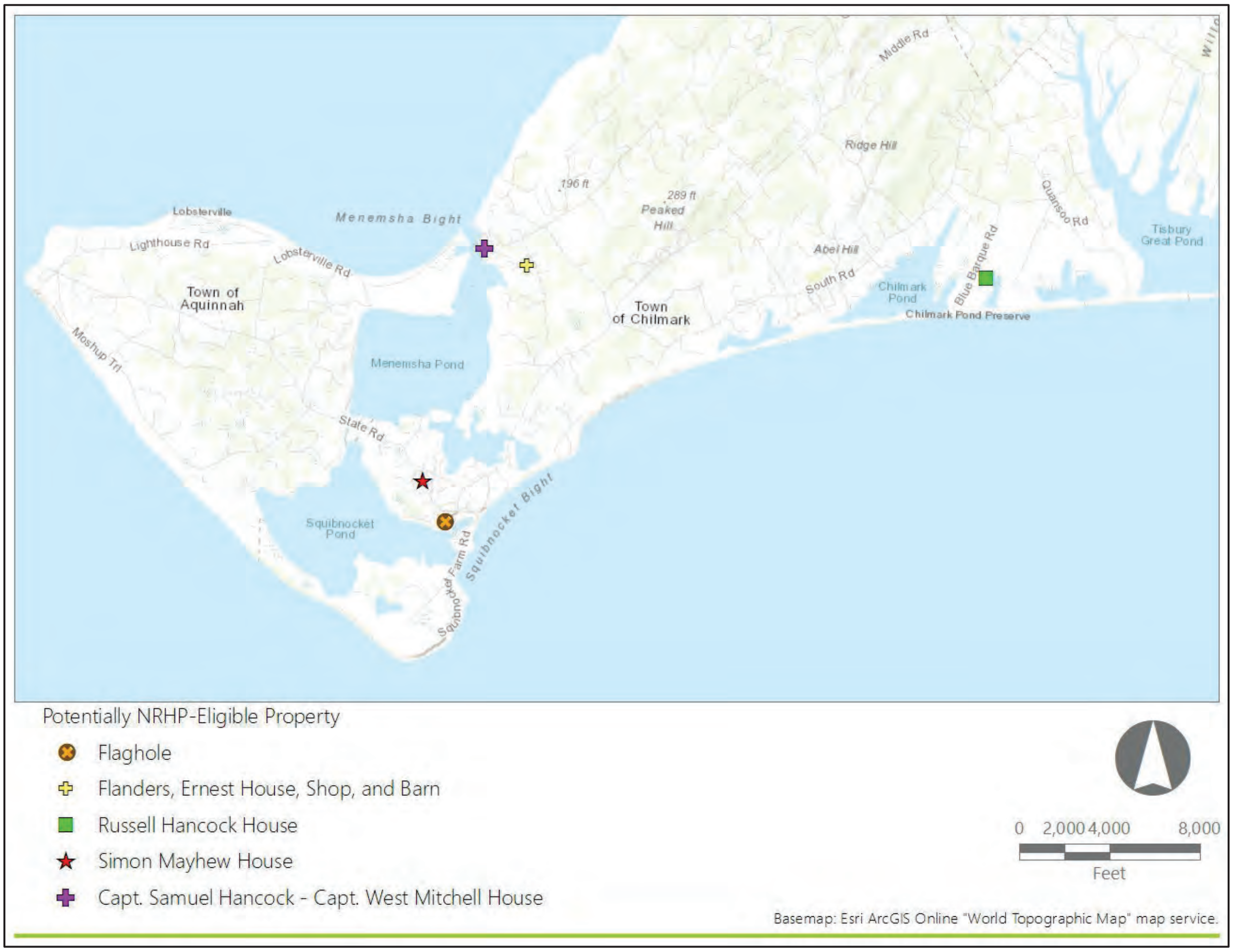
3.1 Historic Properties

This HPTP involves four historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Capt. Samuel Hancock - Capt. West Mitchell House	NRHP-Eligible (MHC Determined)	Chilmark	MA	CHL.35 (MHC)	**Private**	**Historic Buildings and Structures**
Russell Hancock House	MHC Historic Inventory			CHL.38 (MHC)	Private	
Simon Mayhew House	MHC Historic Inventory			CHL.4 (MHC)	Private	
Flaghole	MHC Historic Inventory			CHL.5 (MHC)	Private	
Ernest Flanders House, Shop and Barn	MHC Historic Inventory			CHL.11 CHL.80 CHL.81 (MHC)	Private	

Figure 3.1-1. Historic Property Locations



In Sections 3.3. through 3.6, each historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties included in this HPTP are included in the historic property type defined in the HRVEA as the "Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic

Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the Estates and Estate Complexes property type. These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 The Captain Samuel Hancock – Captain West Mitchell House

3.3.1 Physical Description and Existing Conditions

The Captain Samuel Hancock - Captain West Mitchell House, also known as the Mayhew-Hancock-Mitchell House, is a one-and-one-half-story Cape Cod-style house clad in shingles located on Quansoo Road in Chilmark, Massachusetts. The house is surrounded by open meadow and salt marshes and situated in an open field overlooking Tisbury Great Pond to the east and Black Point Pond to the south and west. The building features an L-shaped plan and sits on a stone foundation. Its side-gabled roof is clad in asphalt shingles from which two interior chimneys rise. The house has little-to-no architectural ornamentation. Fenestration includes two-over-two, six-over-six, and six-over-nine, double-hung windows set in plain surrounds. Doors feature rough vertical boards and latches. A flat-roofed porch is located on the south elevation. The oldest section of the house was built with wattle-and-daub walls, which, according to Adam Moore of the Sheriff's Meadow Foundation, only a few houses in the country still exhibit the technique today. The house is sited on the 146-acre Quansoo Farm, which is owned by the Sheriff's Meadow Foundation. A public walking trail at the site is maintained by the Martha's Vineyard Land Bank Commission. Future uses of the property may be as an educational center with educational programs set up through the Martha's Vineyard Museum (Acruti and Otterson 1998a; Elvin 2017).

3.3.2 Historic Context

The construction date of the Capt. Samuel Hancock - Capt. West Mitchell House is relatively unknown, with recent estimates ranging from 1656 to 1740, to as late as 1793. Original theories of the house (Arcuti and Otteson, 1998a) associate it with the Mayhew family, with some portions of the building being built by Reverend Thomas Mayhew, Jr. as a dwelling house for his family, or as a Wampanoag meeting house. Henry E. Scott, Jr. (1981) suggested that the western section of the main block of the Hancock-Mitchell House was the original part, making a one or two room house. Based on this, the house was thought to date between 1654 (when Mayhew was given permission to build the house) and 1657 (when Mayhew died). According to Arcuti and Otteson (1998a), the Mayhew family resided in the house beginning in the mid-seventeenth century. It was also unclear if Thomas Mayhew, Jr.'s son, John Mayhew, made some building alterations or if a new house was constructed in place of the original house. Eventually, ownership of the house passed to John Mayhew's granddaughter, Deborah Mayhew Norton, who married Russell Hancock in 1766.

The Hancock family continued to expand the house, adding the rear ell during the early nineteenth century and enlarging the house to a full house. This circa 1836 expansion was likely executed by Captain Samuel Hancock, who operated the property as a farm. Later descendants of the Hancock family married into the Mitchell family. One of these descendants, Captain West Mitchell, captained one of the dozens of ships stranded in the Arctic Ocean in the Whaling Disaster of 1871. Descendants of the Mitchell family occupied the house until the 1980s. A major exterior restoration was completed in 2017 and included new cedar shingles, white-painted doors and windows, and a new bulkhead. The goal of the restoration was to restore it to its appearance in the first half of the nineteenth century, when it was owned by Captain Samuel Hancock (Arcuti and Otteson, 1998a; Elvin, 2017).

However, according to Richard L. Burt (2009), the original John Mayhew house was located near the Tiasquam River close to the village of West Tisbury, which was discovered by Burt in the 1970s. According to Burt (2009), a house is not mapped where the Hancock-Mitchell House now stands on the 1781 DesBarres' map, whereas other houses from this period were easily identified. Burt's deed research suggested that the first owner and builder of the Hancock-Mitchell House was James Hancock who bought the property in 1792. James Hancock was the son of Russell Hancock and Deborah Mayhew Norton. Oral histories from the late nineteenth century claim that Mrs. West Mitchell claimed that "her people had bought the place from the Mayhews before 1800 and it was a very old house at the time." Burt theorizes that this information is the basis for assigning the original owners to the Mayhews. He also makes room for the possibility that James Hancock purchased the older section of the house from the Mayhew family and moved it to its present location, as the Tiasquam River house originally built by John Mayhew does not appear to have been used as a residence after 1750. According to Burt (2009), "Additional research of the records and a thorough evaluation of the old farmhouse structure at Quansoo and its site will hopefully yield additional information on the origin and antiquity of this interesting old house."

3.3.3 NRHP Criteria and the Maritime Visual Setting

The property appears to satisfy NRHP eligibility Criteria A and C due to its association with the development of Martha's Vineyard in the seventeenth and eighteenth centuries. In addition, the house is an extant example of the Cape Cod Style of architecture and one of the oldest surviving houses on the island. The property has a significant maritime setting.

3.4 The Russell Hancock House

3.4.1 Physical Description and Existing Conditions

The Russell Hancock House is a one-and-one-half-story Greek Revival-style house located at 146 Quenames Road. The house features a rectangular footprint with a side ell and rests on a granite foundation. The main block and side ell each have four bays wide with an off-center doorway. The side-gabled roof is clad in asphalt shingles and features two flat-roofed dormers on the main block's façade. An oriel window projects from the east elevation. The main entrance features a wide rectangular wood surround evocative of Greek Revival-style architectural detailing. The property is located on a rise in topography north of Quenames Cove and the Atlantic Ocean (Arcuti and Otteson, 1998b).

3.4.2 Historic Context

The Russell Hancock House was constructed circa 1842. The property's namesake was a local businessman and civic leader who was involved in whaling, farming, and carpentry. He was active in the Chilmark Methodist Church and was listed in the town directories of 1897, 1907, and 1911 as a farmer. His son, Herbert C. Hancock, was born in the house and founded a local contracting business in 1914 (Arcuti and Otteson, 1998b).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The property appears to satisfy NRHP eligibility Criterion C, for being architecturally significant as an extant example of the Greek Revival Style. The property has a significant maritime setting and views to the ocean.

3.5 The Ernest Flanders House, Shop, and Barn

3.5.1 Physical Description and Existing Conditions

The Ernest Flanders House is a c. 1840 one-and-one-half story, side-gabled Cape Cod form house with Federal style details. The main block consists of a five-bay by three-bay arrangement with a rear ell. Windows are six-by-six double-hung sash (Arcuti and Otteson, 1998b). The house rests on an ashlar block foundation of granite. West of the house is the small one-story, side-gabled shop with a door on the north elevation. To the west of the shop sets the larger, two-story barn, with large sliding door on the north elevation and shed-roof garage addition on the east elevation. The buildings are sited in the highlands east of Menemsha Pond.

3.5.2 Historic Context

The house, shop, and barn are associated with Ernest and Allen Flanders, both fishermen. The brothers lived on the property through the earliest years of the twentieth century when Allen Flanders moved to his mother's former home. Ernest Flanders also served as Town Treasurer for Chilmark.

3.5.3 NRHP Criteria and the Maritime Visual Setting

The property, as a whole and inclusive of all three historic buildings, appears to meet NRHP eligibility Criterion A for its representation of the evocative vernacular homes and outbuildings scaled to Martha's Vineyard compressed landscapes and for its association with the distinctive mixed agrarian/maritime economies of Martha's Vineyard and, particularly, the areas bordering Menemsha Pond. The house may also meet Criterion C for its well-preserved Federal Period architectural details, including an elegant doorway and flared window architraves (Arcuti and Otteson, 1998b). The siting of the property on an elevated hillside overlooking Menemsha Pond is important to its historic setting and proximity of the property to the docks of Menemsha Pond was likely a factor in its construction by the Flanders brothers.

3.6 The Simon Mayhew House

3.6.1 Physical Description and Existing Conditions

The Simon Mayhew House is a one-and-a-half-story Cape Cod-style residence located in the neighborhood of Nashaquitsa. The setting consists of open, rolling fields overlooking the ocean. The house contains a side-gabled roof clad in wood shingles in the Federal architectural style. The house has a rectangular plan featuring two side ells and is five bays wide by three bays deep. Fenestration includes twelve-over-twelve double-hung windows, and a bay window projecting from the east elevation. The house sits on a stone foundation with a wood shingle roof and siding and encompasses 15.5 acres. The property has a stone structure, locally known as "The Cromlech," which consists of a series of large stones placed on edge in a semi-circular fashion and capped by a large, flat stone. Local myths associate it with possibly early Norse visitors to North America (Arcuti and Otteson 1998c).

3.6.2 Historic Context

The house was likely constructed circa 1780 by Simon Mayhew, an early settler of Chilmark. Note that this Simon Mayhew is not to be confused with the Simon Mayhew who built the house known as "Flaghole" (Section 3.6). The Simon Mayhew House was possibly built by his son of the same name. The property has been relatively unaltered since its original construction (Arcuti and Otteson, 1998c).

3.6.3 NRHP Criteria and the Maritime Visual Setting

The property appears to satisfy NRHP eligibility Criterion C, for being architecturally significant as an extant example of the late eighteenth century Colonial Cape style. The maritime setting is a character-defining feature of this property. The property has a significant maritime setting and views to the ocean.

3.7 Flaghole – Vincent, James House

3.7.1 Physical Description and Existing Conditions

The Flaghole – Vincent, James House, historically called the Simon Mayhew House, is a one-story Cape Cod-style house located on 13.8 acres in the neighborhood of Nashaquitsa. The setting is rural, and the house is located on a rise on open land that slopes to the ocean. The house is a Colonial-Style house with a side-gabled roof clad in asphalt shingles and a stone foundation. The house features a smaller one-story addition projecting on the northeast corner. A central chimney rises from the roof ridge. The south-facing façade features a door with a five-pane toplight. Fenestration consists of six-over-six double-hung windows. The house is surrounded by stone walls into which a peat house once was incorporated into the west of the house. The remains of the peat house consist of an uncovered rectangle of stones with a wooden roof and measures approximately 4 or 5 feet high (Arcuti and Otteson, 1998e).

3.7.2 Historic Context

The house was likely constructed circa 1707 by Simon Mayhew, an early settler of Chilmark. Simon's third son, Samuel, inherited the property in 1791, who then left it to two of his sons, John and Jethro. James Mayhew, son of John, inherited the place in 1825. The house was eventually sold to Ethel Blackwell Robinson, who in turn sold it to Dr. Irving and Elizabeth Clark of Worcester in 1938. As of 1998 and the time of the MHC recordation, the house remained in the Clark family. Originally a half house, a "one-quarter" addition was added in the nineteenth century (Arcuti and Otteson, 1998e).

3.7.3 NRHP Criteria and the Maritime Visual Setting

The property appears to satisfy NRHP eligibility Criterion C, for being architecturally significant as an extant example of the Cape Cod Style. The property has a significant maritime setting as it overlooks Squibnocket Pond and may have some views of the Atlantic Ocean from portions of the property.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Hazard Mitigation Plan for Historic Properties

4.1.1 Purpose and Intended Outcome

The Dukes County Multi-Jurisdictional Hazard Mitigation Plan identifies the reduction in the loss of cultural resources, including the four historic properties identified in this HPTP, as a Community (County-wide) Mitigation Goal (MVC, 2021). The intended outcome of this mitigation measure is to provide funding that will assist the Town of Chilmark to "protect and preserve irreplaceable cultural resources" from the threats posed by flooding, storm damage, and fire through the development of a hazard mitigation plan for historic properties (MVC, 2021). The plan may also include an update of the historic properties inventory per the goals of the 2000-2003 Town of Chilmark Master Plan Supplement.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review of existing town and county planning and hazard mitigation documents, guidance. and regulations;
- Review of existing historic properties inventory;
- Photographs and documentation of existing conditions;
- Public engagement to discuss town-wide historic preservation priorities;
- Development of an updated historic property inventory, if required;
- Distribution of the updated historic property inventory to the Participating Parties, if warranted;
- Drafting of a town historic property-specific hazard mitigation plan;
- Distribution of the draft plan to the Participating Parties for review and comment; and
- Development of the final hazard mitigation plan to be distributed the Participating Parties.

4.1.3 Methodology

Revolution Wind will release an RFP for consultant services to perform the Scope of Work listed in Section 4.1.2. The preferred consultants will have experience in developing hazard mitigation plans for historic properties. The consultants will engage the public and Participating Parties to develop a list of prioritized action items to protect and preserve historic properties. The draft and final plans will be developed in consultation with the Participating Parties.

4.1.4 Standards

The project will comply with following standards:

- The Town of Chilmark Planning Commission guidance, as applicable;
- The Town of Chilmark Community Preservation Commission guidance, as applicable;
- The Town of Chilmark Historical Commission guidance, as applicable;
- Martha's Vineyard Commission planning guidance, as applicable;
- The Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4); and
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP; and
- Photographs and documentation of existing conditions.
- Draft updated historic property inventory, if required
- Final updated historic property inventory, if required
- Draft hazard mitigation plan; and
- Final hazard mitigation plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30 days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Massachusetts Historic Properties, February 10, 2022.
- Follow-up to the Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of Aquinnah Historic Properties, February 1, 2022 with the Martha's Vineyard Commission, March 18, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 16 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE SCRUBBY NECK SCHOOLHOUSE, TOWN OF WEST TISBURY, DUKES COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 16 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Scrubby Neck Schoolhouse
Town of West Tisbury, Dukes County, Massachusetts

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Scrubby Neck Schoolhouse
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Scrubby Neck Schoolhouse, which has been determined by the Massachusetts Historical Commission (MHC) to be eligible for listing on the National Register of Historic Places (NRHP) (the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HREVA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
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- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

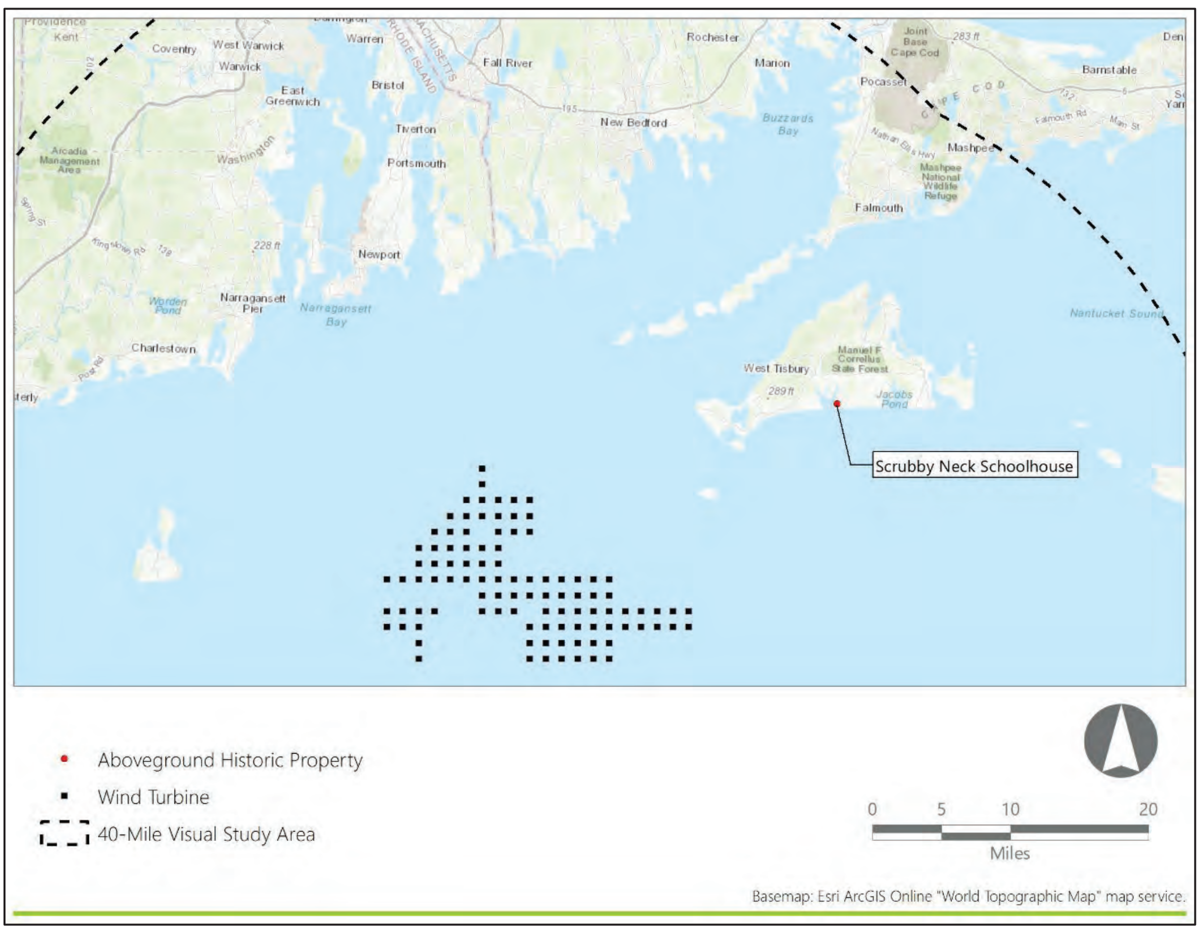
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of West Tisbury
- The Trustees of Reservations
- The Massachusetts Historical Commission.[2]

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

Revolution Wind anticipates the previously listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM’s Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

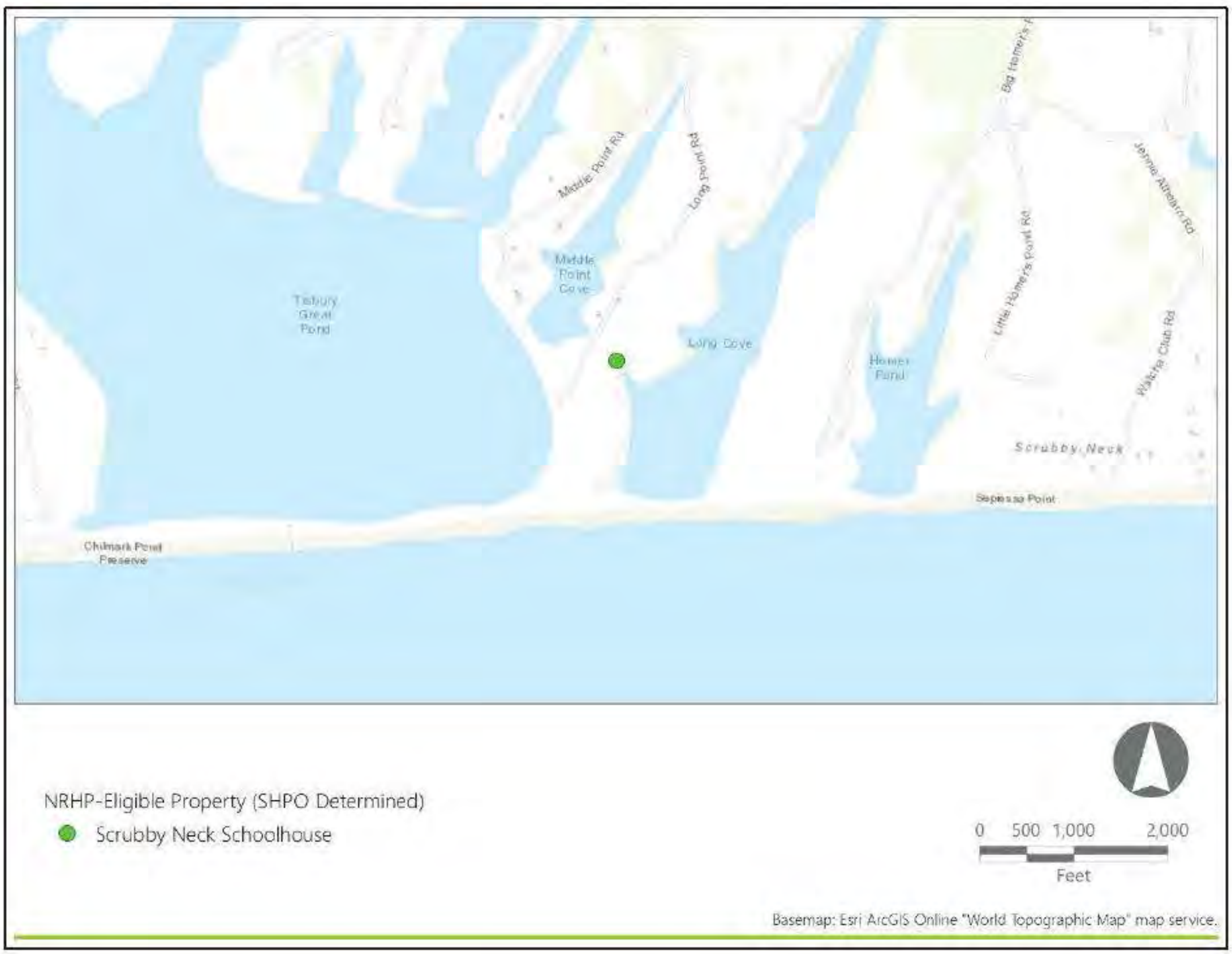
3.1 Historic Property

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
The Scrubby Neck Schoolhouse	MHC Historic Inventory Property	Town of West Tisbury	MA	WTI.170 (MA SHPO)	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The Scrubby Neck Schoolhouse is considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures." Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 The Scrubby Neck Schoolhouse

3.3.1 Physical Description and Existing Conditions

The Scrubby Neck Schoolhouse is a one-room schoolhouse clad in cedar shakes. The building has a simple rectangular plan with two bays of six-over-nine double-hung windows on each long elevation, and a single window of the same construction on the east elevation. An entryway on the west elevation consists of a wood plank door in a simple trim surround. The available photographs depict deteriorated plaster on the interior. The Scrubby Neck Schoolhouse is currently used as a shed for the nearby house at 330 Long Point Road. It is sited on a slight rise on a strip of land that extends between Middle Point Cove and Tisbury Great Pond to the west, and Long Cove to the east. The surrounding landscape consists of a tractor path running to the south, low shrubs and very few trees, and the open waters of the adjacent ponds.

3.3.2 Historic Context

A portion of West Tisbury was subdivided into school districts in 1792. At that time, one-room schoolhouses were typically constructed on less desirable pieces of land. The Scrubby Neck Schoolhouse was built sometime between 1830 and 1850 north of its current site in Scrubby Neck, close to the nineteenth-century center of population (Bouck, 1985). It was moved to its present location at the Long Point Wildlife Refuge at an unknown date prior to the 1951 USGS *Vineyard Haven* map (USGS, 1951).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Scrubby Neck Schoolhouse appears to meet NRHP Criterion C as a one-room schoolhouse built in a vernacular form. The unpainted shingles covering the schoolhouse are a hallmark of vernacular architecture on Martha's Vineyard, and coastal communities in the region. Adding to its architectural significance is the maritime setting of the property, located on a flat coastal area with visibility of the ocean to the south.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Schoolhouse Conditions Assessment and Feasibility Plan

4.1.1 Purpose and Intended Outcome

The Scrubby Neck Schoolhouse is currently being used as a storage building owned by the Trustees of Reservations. This mitigation measure will fund a conditions assessment and adaptive reuse plan to ensure the long-term use and preservation of the building. The plan will identify and prioritize restoration needs and possible future uses of the building and can be used as a guide for future repairs, cyclical maintenance and other restoration needs.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review the existing conditions of the property;
- Document and photograph the existing conditions;
- Consult with the Participating Parties to determine possible future uses;
- Analyze the local market and feasibility of reuse;
- Draft a Conditions Assessment and Feasibility Plan to be distributed to the Participating Parties for review and comment;
- Develop a final Conditions Assessment and Feasibility Plan, incorporating any comments from the Participating Parties; and
- Distribute the final Conditions Assessment and Feasibility Plan to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the Scope of Work listed in Section 4.1.2. The chosen consultant should have a demonstrated knowledge of historic properties and adaptive reuse plans. The consultant will perform background research and documentation of the existing conditions and will engage with the Participating Parties to determine feasible future uses for the property. A draft of the documents will be provided to the Participating Parties for review and comment. A final plan will be developed incorporating any comments from the Participating Parties and will be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with following standards:

- The Town of West Tisbury Building Department guidance and regulations, as applicable;
- *Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* (Nelson, 1988);
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68); and
- The National Park Service's *Guidelines for Architectural and Engineering Documentation* (NPS, 2003).

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Photography and documentation (e.g., mapping);
- Preliminary draft of the Conditions Assessment and Feasibility Plan; and
- Final Conditions Assessment and Feasibility Plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
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- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Massachusetts Historic Properties, February 10, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 17 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE KAY STREET-CATHERINE STREET-OLD BEACH ROAD HISTORIC DISTRICT/THE HILL, THE OCHRE POINT – CLIFFS HISTORIC DISTRICT, AND THE OCEAN DRIVE HISTORIC DISTRICT NATIONAL HISTORIC LANDMARK, CITY OF NEWPORT, NEWPORT COUNTY, RHODE ISLAND

[Insert ATTACHMENT 17 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Kay Street – Catherine Street-Old Beach Road Historic District/The Hill

The Ochre Point – Cliffs Historic District

The Ocean Drive Historic District, National Historic Landmark

City of Newport, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill, The Ochre Points – Cliffs Historic District The Ocean Drive Historic District, National Historic Landmark
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MOA	Memorandum of Agreement
NHL	National Historic Landmark
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal

ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Kay Street-Catherine Street-Old Beach Road Historic District/The Hill, which is listed on the National Register of Historic Places (NRHP); The Ochre Points – Cliffs Historic District, which is listed on the NRHP; and the Ocean Drive Historic District, a National Historic Landmark, (hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

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The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).

[1] The timeline is subject to change and is based on current available information.

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- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

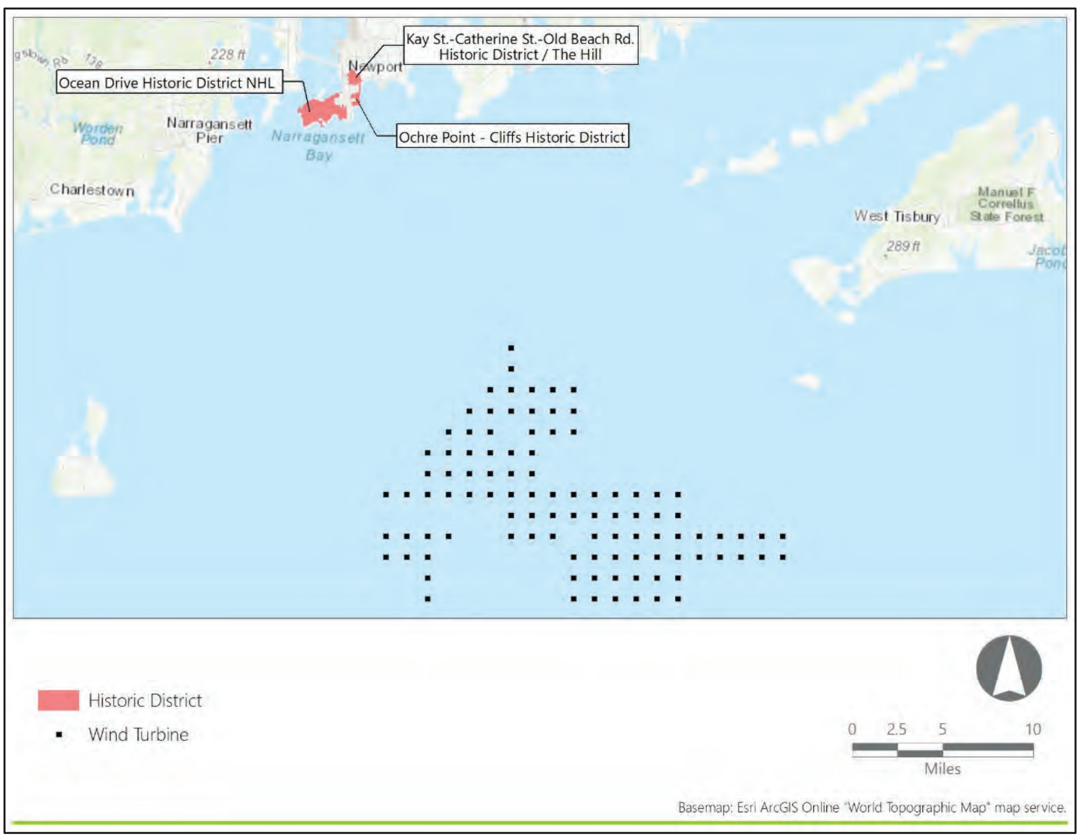
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. The RIHPHC holds preservation easements on the below properties per RI Gen L, Title 42, Section 42-45-9.1 (see Table 2.2.2-1). Any mitigation work will comply with the conditions of all extant historic preservation easements. Additional information regarding compliance with extant preservation restrictions appears below in Section 5.0, Implementation.

Table 2.2.2-1. Restrictions at the Historic Properties

Historic Property Name	Location
Redwood Library	50 Bellevue Avenue
Griswold House (Newport Art Museum)	76 Bellevue Avenue
Cushing Gallery	76 Bellevue Avenue
The Kedge	397 Gibbs Avenue
Harbor Court	5 Halidon Avenue

Historic Property Name	Location
Touro Synagogue National Historic Site	72 Touro Street
Bienvenue	97 Narragansett Avenue
Ochre Court	16 Ochre Point Avenue
The Breakers	44 Ochre Point Avenue
Seaward	49 Cliff Avenue

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- The City of Newport
- The Newport Restoration Foundation
- The Newport Historic District Commission
- The Preservation Society of Newport County
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

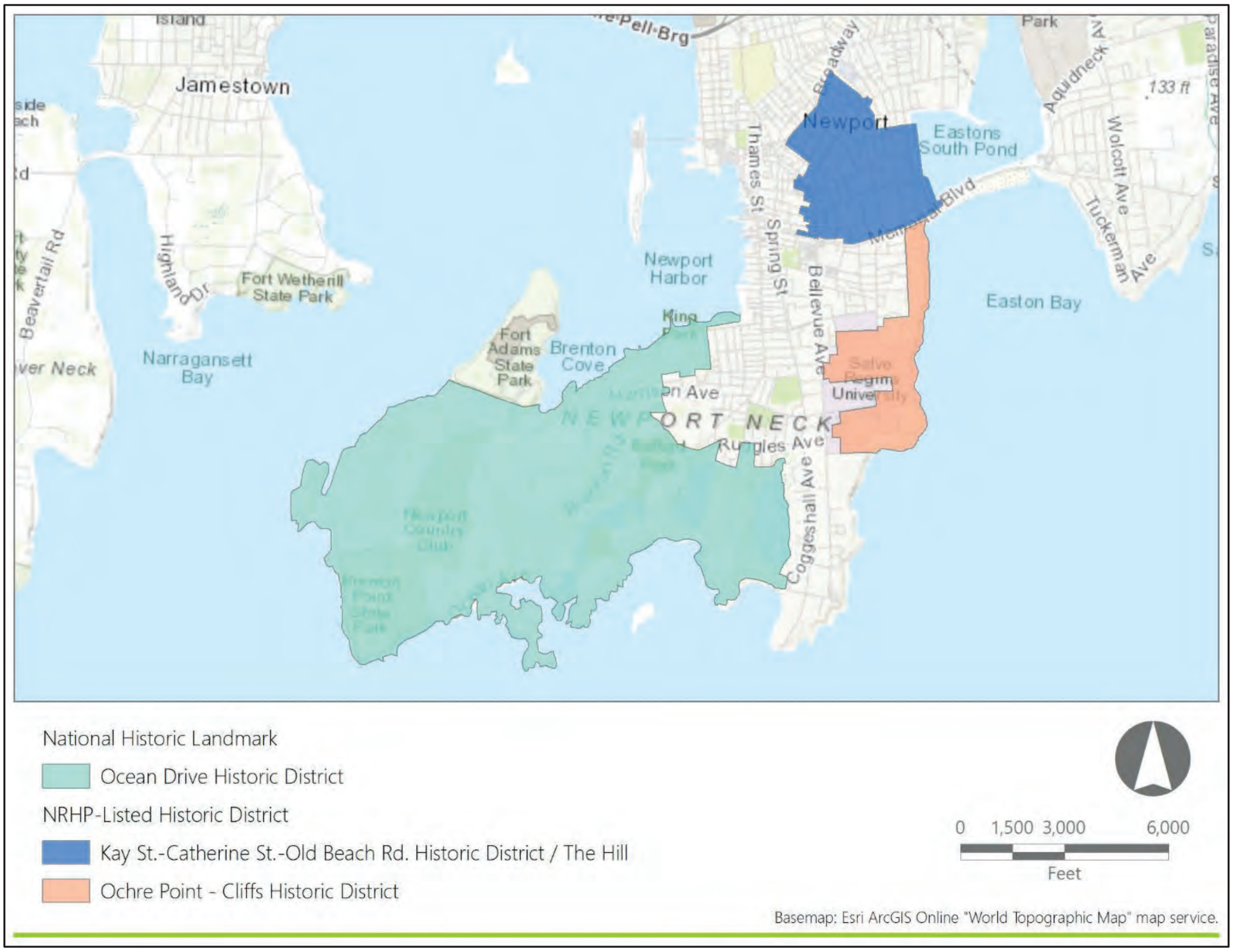
3.1 The Historic Properties

This HPTP involves three historic districts, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type	Historic Property Type
Kay Street-Catherine Street-Old Beach Road Historic District/The Hill	NRHP-Listed	City of Newport	RI	73000052 (NPS)	Public/private	Historic Buildings and Structures	Estates and Estate Complexes
Ochre Point – Cliffs Historic District	NRHP-Listed	City of Newport	RI	75000211 (NPS)	Public/private	Estates and Estate Complexes	Estates and Estate Complexes
Ocean Drive Historic District	National Historic Landmark	City of Newport	RI	76000048 (NPS)	Public/private	Estates and Estate Complexes	Estates and Estate Complexes

Figure 3.1-1. Historic Property Locations



In Sections 3.3 through 3.5, each resource is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA "Estates and Estate Complexes" and "Historic Buildings and Structures." Each property type is defined below as well as the characteristics typical of their maritime setting.

"Estates and Estate Complexes" consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris

Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer "cottages" built by wealthy industrialist families, drawn to the vicinity of Newport, Rhode Island as it became a prominent vacation and recreation area for the emerging American elite, and to Montauk Point as a naturalistic and remote enclave.

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

"Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the "Estates and Estate Complexes" property type (see below). These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Historic Buildings and structures not fitting within the previously described types occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill

3.3.1 Physical Description and Existing Conditions

The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill was listed on the NRHP on May 22, 1973 (Chase, 1973). The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill includes 662 contributing resources in a 245-acre area. The majority of the resources are residential properties constructed between 1835 and 1945 and vary in architectural style. Institutional buildings, commercial buildings, summer and year-round homes are all located within the district, as well as the Redwood Library, a National Historic Landmark. The district contains buildings designed by some of the most notable American architects of their time, including McKim, Mead & White, Peabody & Stearns, Sturges & Brigham, and Richard Morris Hunt (Chase, 1973).

3.3.2 Historic Context

In the 1840s the community of Newport was becoming a summer destination and inns, hotels, and lodging houses were constructed to meet the needs of the increasing number of tourists. By the mid-nineteenth century, the large summer cottages that Newport is known for were being constructed. This area, known as "The Hill," is located to the east of the commercial center of the city and was an ideal location for some of the first summer houses including Kingscote and the Red Cross Cottage. Commercial buildings and less grand residences were also constructed in the district in the 1850s. According to the NRHP nomination form (Chase, 1973), within the district approximately 75 homes were constructed in the 1870s and 100 buildings were constructed in the 1880s. Starting in the 1890s, more modest homes were being constructed within the district and the trend continued through the 1940s. The contributing properties within the Kay Street-Catherine Street-Old Beach Road Historic District/The Hill decreased from 666 to 129 in 2018 as the result of a boundary decrease that clarified the geographic boundaries of the Kay Street-Catherine Street-Old Beach Road Historic District/The Hill and reduced overlap with the adjacent NHL Newport Historic District (Warbuton, 2018).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Kay Street-Catherine Street-Old Beach Road Historic District/The Hill is significant under Criterion C for its architecture and the role the area played in the development of Newport as a summer tourist destination. The buildings within the district exemplify the district's role as a fashionable summer resort starting in the mid-nineteenth century with the building of the first hotels to the imposing high-style mansions of the Gilded Age.

3.4 The Ochre Point – Cliffs Historic District

3.4.1 Physical Description and Existing Conditions

The Ochre Point – Cliffs Historic District is located in the eastern portion of Newport and is roughly bounded to the north by Memorial Boulevard, to the east by Easton Bay, to the south by Marine Avenue and to the west Bellevue Avenue. Seventy-one contributing resources are identified in the National Register Nomination Form. The Cliff Walk, which is a 3.5-mile, National Recreational Trail, that runs from First/Easton's Beach to Baileys Beach, is also a contributing resource to the Ochre Point – Cliffs Historic District.

3.4.2 Historic Context

Like many coastal New England cities and towns, Newport became a summer resort destination in the mid-nineteenth century. Properties along and adjacent to Bellevue Avenue were chosen as prime locations for some of the wealthiest Americans to build summer cottages due to their locations on the cliff and views to the water. Most of the properties also had designed landscapes surrounding the buildings.

3.4.3 NRHP/NHL Criteria and the Maritime Visual Setting

The Ochre Point – Cliffs Historic District is significant under Criterion A for its contribution to Newport becoming a summer resort and the social history of its summer residents and Criterion C for its architecture and designed landscapes.

As stated above, contributing resources of the Ochre Point – Cliffs Historic District were constructed on or nearby Bellevue Avenue to take advantage of the views of Easton Bay and the Atlantic Ocean. The landscapes surrounding many of the properties were also designed to take advantage of the views. The Cliff Walk features expansive views of the Atlantic Ocean, which are integral to the visual and maritime setting of the trail.

3.5 The Ocean Drive Historic District, National Historic Landmark

3.5.1 Physical Description and Existing Conditions

The Ocean Drive Historic District is both listed on the NRHP and was designated as an NHL district on May 11, 1976 (Longstreth, 1976; Pitts, 1976). The Ocean Drive Historic District is made up of 45 contributing properties located in a 1,509-acre suburban/rural setting encompassing most of the Newport Neck peninsula southwest of the City of Newport, Rhode Island. The summer homes in this district feature great variety in style and opulence, ranging from Neoclassical-style residences to early nineteenth-century farms. The coastline features promontories and jetty-like rock formations.

3.5.2 Historic Context

The first European to occupy Newport Neck was William Brenton, who was an important founding figure in the history of Newport. Brenton and his descendants worked to develop the landscape for agriculture, erected the first buildings, and cut trails for the frequent visitors to the land. The area became a seasonal retreat for the wealthy even prior to the Revolutionary War. After being destroyed by the British during the Revolutionary War, Newport Neck remained rural for decades. By the mid-nineteenth century the community in Newport and along Bellevue Avenue to the north and east of the present-day Ocean Drive Historic District grew and the elite citizens utilized Newport Neck for daytime excursions to enjoy the pastoral setting. By the turn of the twentieth century, overland transportation had improved, and the building of large estates began. Landscape development was carried out by the well-known landscape architect Frederick Law Olmsted and his firm. In the late twentieth century, several of the large estate houses were demolished, but the rural character of the district was cultivated and maintained (Longstreth, 1976).

3.5.3 NRHP/NHL Criteria and the Maritime Visual Setting

The summer homes in the Ocean Drive Historic District feature great variety in style and opulence, ranging from Neoclassical-style mansions to early nineteenth-century farms. In contrast to the adjacent Bellevue Avenue Historic District, however, Ocean Drive (aka Ocean Avenue) is decidedly more bucolic and rural, with greater expanses between structures accentuated by natural and designed landscapes. The national significance of the Ocean Drive Historic District is derived from its architecture, which includes works from McKim, Mead and White, John Russell Pope, and landscape architecture by Frederick Law Olmstead (Pitts, 1976). In 2012 an updated statement of significance was appended to the NHL nomination which elaborated and expanded upon the initial areas of Criterion C significance such as architecture and landscape design. The update also addressed additional Criterion A areas of significance such as planning, and engineering related to maritime views and design features purposefully built to interact with the shoreline and the ocean. The updated nomination materials also included a detailed account of the evolution of Ocean Drive as a "pleasure drive" to accompany the development of the inland areas as an upper-income resort suburb. In addition, the landscape architecture firm of Frederick Law Olmstead was involved in at least two subdivisions and 15 private contract designs within the district. These designs include properties situated on dramatic overlooks, and along Ocean Drive (Reed, 2012). Clearly this roadway was specifically constructed to take advantage of ocean views.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected, and the heightened significance and standard of care for the NHL. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Property Owner Guidebook

4.1.1 Purpose and Intended Outcome

The 2017 *City of Newport's Comprehensive Land Use Plan* states "Newport's historic, architectural, and maritime resources are the City's greatest assets in shaping a vision for the future" (Matrix Design Group, 2017). In addition, the *City of Newport, Rhode Island Natural Hazard Mitigation Plan* "calls for the development and implementation of a plan to protect historic structures" (City of Newport, 2016.) The purpose of this mitigation measure is to provide funding for the development of a historic property owner guidebook per the goal "to identify, protect, and enhance the City's cultural and historical resources" identified in the comprehensive plan (Matrix Design Group, 2017).

The guidebook will update the existing *Standards and Guidelines for the Newport Local Historic District* which was revised in 2016 with a focus on climate change, resiliency planning, and energy efficiency in historic buildings. This guidebook will provide easy to understand guidance using both text and illustrations to increase public awareness and knowledge regarding best practices for historic properties.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review the existing guidelines, laws, regulations, city plans, building code and other applicable sources;
- Review and understand best practices in climate change, resiliency planning, and energy efficiency in historic buildings;
- Consult with the Participating Parties and the public to develop an understanding of the needs of the community;
- Develop a draft guidebook incorporating the concerns of the public and Participating Parties;
- Distribute the draft guidebook to the Participating Parties for review and comment; and
- Produce a final guidebook for the owners of historic properties to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The chosen consultant should have a demonstrated knowledge of climate change and the treatment of historic properties. Public engagement sessions to inform the public on the intersection of climate change, resiliency planning, energy efficiency, and historic preservation. A draft set of guidelines will be prepared incorporating the comments from the public and Participating Parties. The draft guidebook to the Participating Parties for review and comment. The comments will be incorporated into the production of a final guidebook for the owners of historic properties to be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with the following standards:

- The Secretary of the Interior's Standards and Guidelines for Treatment of Historic Properties (36 CFR 68);
- The National Park Service's *Creating and Using Design Guidelines;*
- The 2017 *City of Newport's Comprehensive Land Use Plan*;
- The *City of Newport, Rhode Island Natural Hazard Mitigation Plan;*
- The City of Newport Building, Zoning, and Inspections; and
- The City of Newport Historic District Commission.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Consultant bids in response to RFPs;
- Draft Historic Property Owner Guidebook; and
- Final Historic Property Owner Guidebook.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Stormwater Drainage Improvement Plans for the Historic Districts

4.2.1 Purpose and Intended Outcome

One of the goals identified in the 2017 *City of Newport's Comprehensive Land Use Plan* is to "provide a comprehensive, City-wide stormwater plan and implementation strategy to protect public safety and property" (Matrix Design Group, 2017). One of the policies in the plan is to "implement innovative measures, such as Green Infrastructure, to manage storm water" (Matrix Design Group, 2017).

This HPTP proposes the completion of plans to improve overall stormwater drainage for the historic districts and create areas of permeable surfaces to decrease the likelihood of flooding occurring in and around historic properties. The intended outcome is to provide funding to the City of Newport to create conceptual plans to improve stormwater drainage within the historic districts, similar to the Hillside Avenue Green Infrastructure project (City of Newport Utilities Department Stormwater Projects, 2018). The plans may include green parking lots, streets and sidewalks, permeable pavement, biosawles, rain gardens, blue and green roofs, among other green infrastructure solutions (NRDC, 2019).

4.2.2 Scope of Work

The scope of work will consist of the following:

- Review the current stormwater management plans;
- Review the city's applicable guidance and regulations;
- Document existing conditions including mapping and photography;
- Consult with the Participating Parties;
- Review and understand best practices in green infrastructure and stormwater management;
- Identify areas of improvement within the existing plans;
- Develop a draft plan in consultation with Participating Parties;
- Distribute the draft plan to the Participating Parties for review and comment; and

- Develop a final plan which incorporates any comments received and the distribution of the plan to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.2.2. The preferred consultant would be a qualified civil engineer with a demonstrated experience in modern concepts of stormwater management in a coastal context and preferably a demonstrated competence in historic preservation practices and the Secretary of the Interior's Standards for the Treatment of Historic Properties. The consultant will conduct a comprehensive review of existing storm water features and the existing condition of the current plan and infrastructure. The consultant will meet with the Participating Parties to determine the current status and needs of the city. A draft plan will be developed and distributed to the Participating Parties for review and comment. The final plan will incorporate any comments and will be provided to the Participating Parties.

4.2.4 Standards

The project will comply with following standards:

- The U.S. Environmental Protection Agency guidance and regulations, as applicable;
- The Secretary of the Interior's Standards and Guidelines for Treatment of Historic Properties (36 CFR 68);
- The National Park Service's *Creating and Using Design Guidelines;*
- The 2017 *City of Newport's Comprehensive Land Use Plan*;
- The *City of Newport, Rhode Island Natural Hazard Mitigation Plan;*
- The City of Newport Department of Utilities guidance and regulations, as applicable;
- The City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable;
- The City of Newport Historic District Commission guidance and regulations, as applicable; and
- The City of Newport Department of Planning & Economic Development guidance and regulations, as applicable The City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Photography and documentation of existing conditions;
- Preliminary stormwater management plan; and
- Final stormwater management plan.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Newport Historic Properties, January 25, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 18 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BELLEVUE AVENUE HISTORIC DISTRICT, ROSECLIFF, THE BEAKERS, AND THE MARBLE HOUSE, CITY OF NEWPORT, NEWPORT COUNTY, RHODE ISLAND

[Insert ATTACHMENT 18 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Bellevue Avenue Historic District

Rosecliff

The Breakers

The Marble House

City of Newport, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Bellevue Avenue Historic District, National Historic Landmark Rosecliff The Breakers, National Historic Landmark The Marble House, National Historic Landmark
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft, applicant-proposed Historic Property Treatment Plan (HPTP) for the Bellevue Avenue Historic District, a National Historic Landmark; Rosecliff, which is listed on the National Register of Historic Places (NRHP); the Breakers, a National Historic Landmark; and the Marble House, a National Historic Landmark (hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

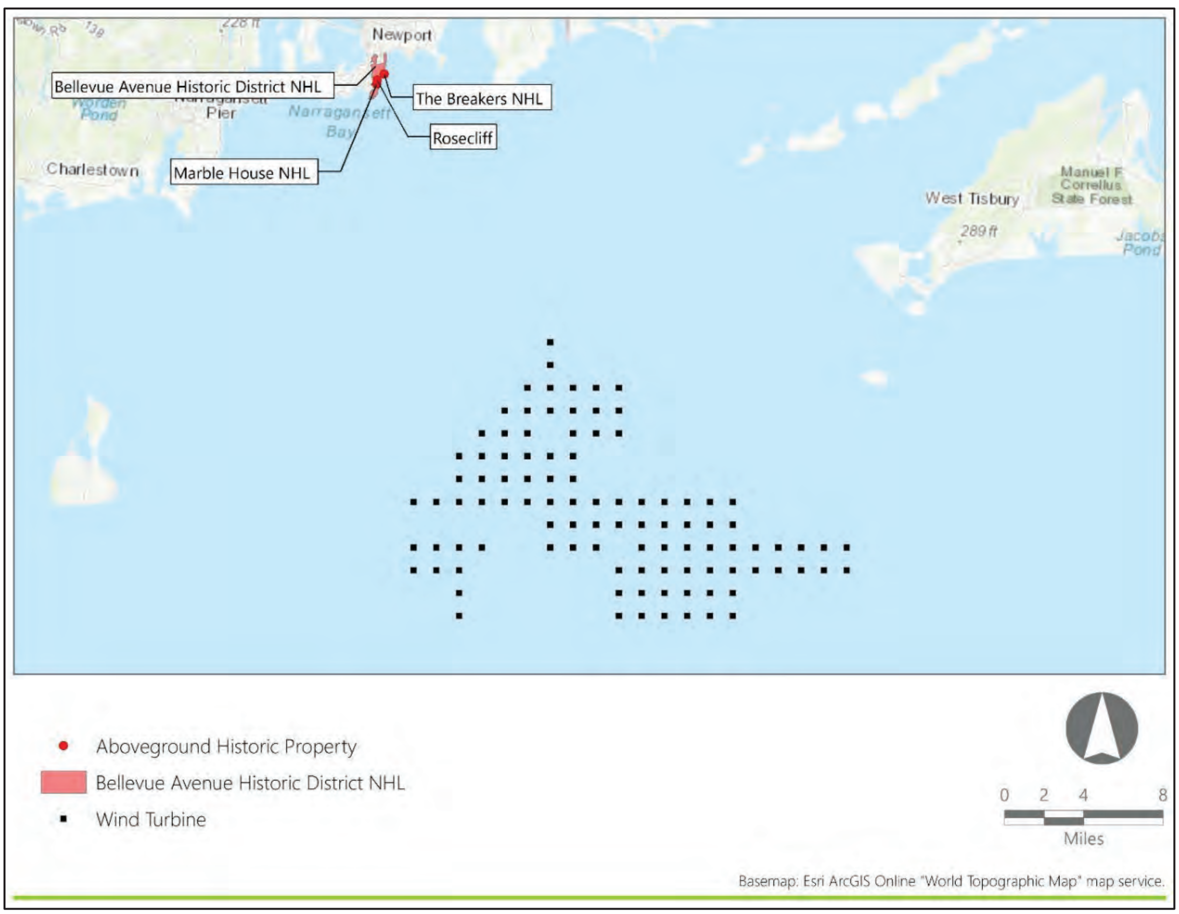
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. The RIHPHC holds preservation easements on the below properties per RI Gen L, Title 42, Section 42-45-9.1 (see Table 2.2.2-1). Any mitigation work will comply with the conditions of all extant historic preservation easements. Additional information regarding compliance with extant preservation restrictions appears below in Section 5.0, Implementation.

Table 2.2.2-1. Restrictions at the Historic Properties

Historic Property Name	Location
Newport Casino	186-202 Bellevue Avenue
Kingscote	253 Bellevue Avenue
Chateau-sur-Mer	424 Bellevue Avenue
Chinese Tea House at Marble House	596 Bellevue Avenue

Seaward	49 Cliff Avenue
Faxon Lodge	28 Gammell Road
Edward King House	35 King Street
Bienvue	97 Narragansett Avenue
Ochre Court	16 Ochre Point Avenue
The Breakers	44 Ochre Point Avenue

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following:

- The City of Newport
- The Newport Restoration Foundation
- The Newport Historic District Commission
- The Preservation Society of Newport County
- The Rhode Island Historical Preservation & Heritage Commission

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

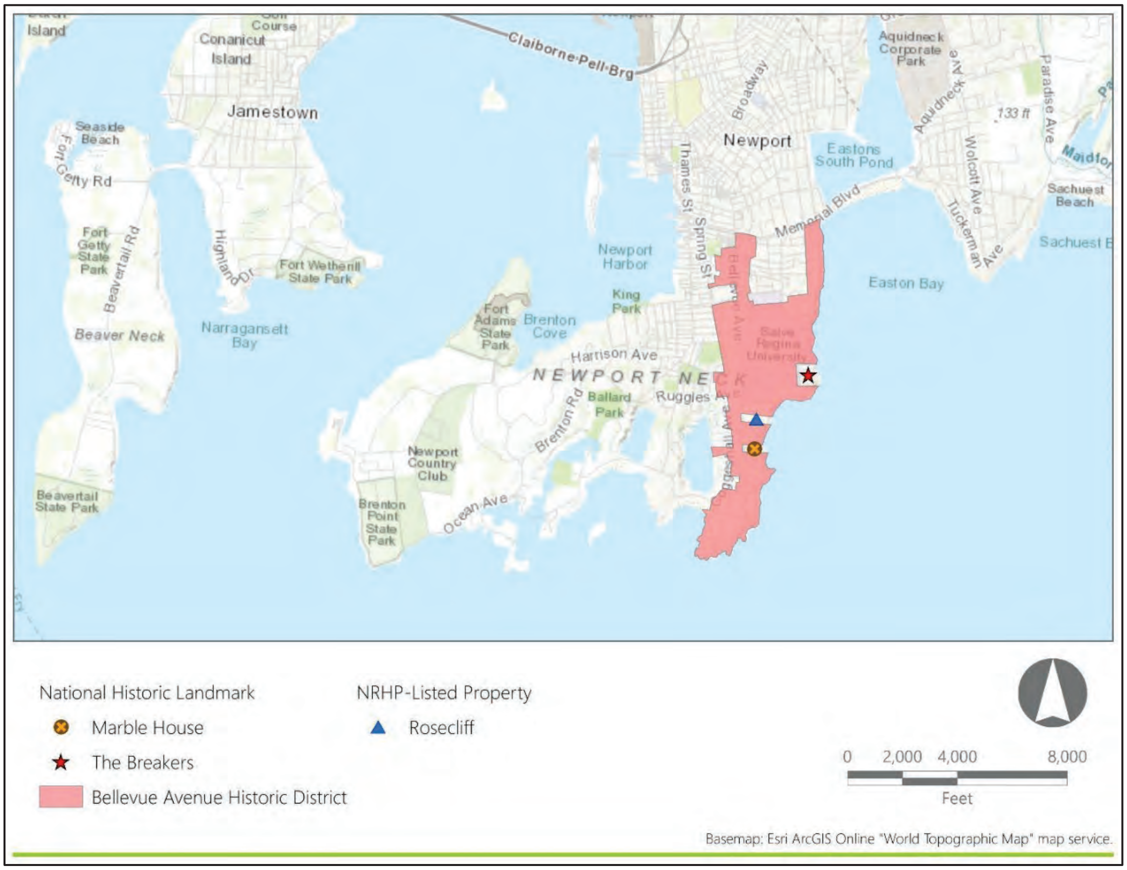
3.1 Historic Properties

This HPTP involves four historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Bellevue Avenue Historic District	National Historic Landmark	Newport	RI	NRIS ID: 72000023	Private	Estates and Estate Complexes
Rosecliff	NRHP-Listed			NRIS ID: 73000059	Preservation Society of Newport County	
The Breakers	National Historic Landmark			NRIS ID: 71000019		
Marble House	National Historic Landmark			NRIS ID: 71000025		

Figure 3.1-1. Historic Property Location



In Sections 3.3 through 3.6, the historic properties are described both physically and within their historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included in the property type defined in the HRVEA as "Estates and Estate Complexes," and consist of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer "cottages" built by wealthy industrialist families, drawn to the area as it became a prominent vacation and recreation area for the emerging American elite.

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

3.3 Bellevue Avenue Historic District National Historic Landmark

3.3.1 Physical Description and Existing Conditions

The Bellevue Avenue Historic District National Historic Landmark is approximately two miles long and consists of 87 contributing properties in a 606-acre district occupying several blocks along Bellevue Avenue, from Memorial Boulevard in the north, to Block Island Sound in the south, in the City of Newport. Spring Street and Cogshell Avenue form the western boundary of the district, while Narragansett Bay forms the eastern boundary. From north to south, this district features two miles of commercial blocks and villas, notably ending in the south with the grand and palatial nineteenth-century estates of wealthy summer residents.

The Cliff Walk is a contributing resource to the Ochre Point-Cliffs Historic District, which is part of the Bellevue Avenue Historic District, and designated a National Recreational Trail. The Cliff Walk extends approximately 3.5 miles along the eastern coastline of Aquidneck Island and the Bellevue Avenue Historic District, situated on the rocky outcrops of the shore and featuring expansive views of Easton Bay and the Atlantic Ocean. The Cliff Walk is part of the typical experience for visitors to the Newport mansions, is open to the public, and has been described as "Rhode Island's #1 tourist destination" with (reportedly) over 1.2 million visitors per year (Winthrop, 2021). Portions of the Cliff Walk were washed away in Hurricane Sandy and were recently restored/rebuilt with grant funds from the RIHPHC and National Park Service (RIHPHC, 2019).

3.3.2 Historic Context

During its early decades and up to the mid-nineteenth century, Newport primarily grew around the downtown area to the north of Bellevue Avenue. The notable historic properties within the National Historic Landmark district were built during the Gilded Age, when some of the wealthiest Americans engaged in massive high-style residences for use as summer homes. Many of the estates in this district were designed by world-renowned master architects, including Richard Upjohn, Richard Morris Hunt, and McKim, Mead, and White. The district possesses many distinctive examples of high-style architecture. The district was listed as a National Historic Landmark on May 11, 1976.

3.3.3 NRHP/NHL Criteria and the Maritime Visual Setting

The significance by which the district was originally listed is primarily focused on architecture, commerce, and landscape architecture. While the significance attributed to the district does not explicitly reference the ocean, the estates were sited to take advantage of the ocean views. For example, property names such as "Sea View Terrace" and "Ocean View" imply that maritime views are essential to the district's identity. In addition, the NRHP nomination form for the Ochre Point-Cliffs Historic District (a contributing property to the Bellevue Avenue Historic District NHL), contains the following reference:

> *[The Ochre Point-Cliffs Historic District] has a fine, elevated north-easterly view over the lower, Easton's Beach, part of Newport, and, easterly out past Middletown's hill and on towards Sakonnet, Westport and Cape Cod, far out into the Atlantic horizon. This high, grassed promontory had its obviously desirable features even though Bellevue Avenue was the first fashionable allee* (Harrington, 1974).

A major focus of the Ochre Point-Cliffs Historic District portion of the Bellevue Avenue Historic District is the Cliff Walk. The Cliff Walk was designed specifically to afford maritime views, as illustrated in the following excerpt from the nomination document:

> *The [Cliff]Walk provides spectacular views at every point, as it winds near many mansions and occasionally dips down to the shore. Originally a fishermen's trail, the Cliff Walk was at one time the subject of a court battle between the owners of the estates bordering the walk-way and the public. The estate-owners wished to prevent public access and viewing across their properties and erected gates and other barriers to close the Walk and prevent such nuisance. Such action outraged the native Newporters, who went to court and won a decision which re-asserted the right of the public to an unobstructed foot-way around the island. Thus, the barriers were removed, and the present foot-path was laid out, with much use ever since, with maintenance undertaken first by the Works Progress Administration in the 1930's-1940's, and by the municipality in more recent years* (Harrington, 1974).

3.4 Rosecliff

3.4.1 Physical Description and Existing Conditions

Rosecliff, also known as the Hermann Oelrichs House and the J. Edgar Monroe House, is located at 548 Bellevue Avenue in Newport. The building was designed by McKim, Mead & White for Mrs. Hermann Oerlichs and was completed in 1902. Rosecliff is located on the east side of Bellevue Avenue overlooking Sheep Point Cove and the Atlantic Ocean. The house was designed by Stanford White and modeled after the Grand Trianon in Versailles in the neo-classical style as a summer home for the Oerlichs family (Harrington, 1972). The building features a basic H-shaped form and is constructed in brick clad in white terracotta. The elaborate festooning and details underscore the grandeur of its massing. The landscape is an excellent example of a manicured Gilded Age lawn, and features highly stylized steps, statuary, and a fountain.

3.4.2 Historic Context

Theresa Fair Oelrichs was a wealthy silver heiress and became a member of a “triumvirate” of wealthy women who managed large mansions in Newport. In service of the formal expectations of the day, Rosecliff was constructed in 1902 primarily for socializing and entertaining among the wealthy and elite of the turn of the twentieth century. The property was in the Oerlichs family until 1941, when it was sold to Mr. and Mrs. Edgar Monroe. The Monroe family donated the property to the Preservation Society of Newport County in 1971. Since that time, Rosecliff has played a prominent role in the local preservation movement.

3.4.3 NRHP/NHL Criteria and the Maritime Visual Setting

The original NRHP documentation indicates that the property was listed due to its architectural significance (Harrington, 1972). However, as with the other grand homes in Newport built during the Gilded Age, Rosecliff is situated on a large, manicured lot, with the main entrance facing Bellevue Avenue and the rear of the house and back yard situated to afford ocean views.

3.5 The Breakers National Historic Landmark

3.5.1 Physical Description and Existing Conditions

The Breakers National Historic Landmark, also known as the Cornelius Vanderbilt II House, is located at 44 Ochre Point Avenue. It emulates a sixteenth-century, northern Italian palazzo. The architecture features elaborate façade work and imposing mass and speak to the substantial power and wealth of the original residents. The building is three stories high and overlooks the ocean to the east. The building is characterized by an imposing mass and scale, complimented by elaborate Neoclassical ornamentation, set within a designed landscape context to focus attention to the exterior of the residence when viewed from the lawn.

3.5.2 Historic Context

The Breakers estate was designed by Richard Morris Hunt and built between 1893 and 1895 for Cornelius Vanderbilt II. As the preeminent “summer cottage” among the Newport mansions, the Breakers symbolized the accumulation of massive wealth by the Vanderbilts during the Gilded Age. The property was first leased by the Preservation Society of Newport County in 1948, which later purchased the property in 1972. The descendants of the original owners still occupy the third floor.

3.5.3 NRHP/NHL Criteria and the Maritime Visual Setting

The estate is nationally significant for its historic associations with America’s first architect trained at the Ecole Des Beaux-Arts, Richard Morris Hunt, and for being the largest and perhaps most famous Newport estate built by a wealthy patron, Cornelius Vanderbilt II, at the turn of the twentieth century (Harrington, 1971; Tschirch, 2005). The Breakers was individually listed in the NRHP in 1971 and designated an NHL in 1994. The discussion in the NRHP and NHL documentation focuses on specific elements of building and landscape architecture within the boundary of the Breakers’ property. While the elements themselves may have been constructed, oriented or designed to engage with views toward the ocean, there is no explicit reference in the nomination to the consideration of maritime views. However, the main building is oriented to face south-east across the open sloping lawn toward the sea. In addition, the Cliff Walk passes through/adjacent to the property along the shoreline, although it is not a contributing resource to the NHL property.

3.6 Marble House National Historic Landmark

3.6.1 Physical Description and Existing Conditions

The Marble House National Historic Landmark is a three-story Beaux Arts-style mansion located at 596 Bellevue Avenue in Newport, Rhode Island. The building features a two-story Corinthian portico, a balustrade along the roof line, and other examples of rich architectural flourishes evocative of the Gilded Age Newport mansions. A U-shaped driveway leads from Bellevue Avenue to the front portico. The building is set within a manicured landscape with an Orientalist “Chinese Teahouse” overlooking Sheep’s Cove accessed by a meandering trail.

3.6.2 Historic Context

The Marble House was constructed for William Vanderbilt and designed by famed architect Richard Morris Hunt in 1892. Built with an imposing architectural scale and clad in Tuckahoe white marble, it is one of the stateliest mansions within the Bellevue Avenue Historic District. The property was individually listed on the NRHP in 1972. It was individually listed as a National Historic Landmark in 2006.

3.6.3 NRHP/NHL Criteria and the Maritime Visual Setting

The NHL nomination describes Marble House as “a temple on a landscape atop the cliff of Newport overlooking the Atlantic Ocean” and emphasizes the property’s position atop a thirty-foot cliff and the “Chinese Teahouse” perched atop the cliff (Tschirch, 2005). The property, main structure, and Teahouse are sited to afford open views of the ocean views. The Cliff Walk passes through/adjacent to the eastern boundary of the property.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior (SOI) Qualifications Standards for History, Architectural History and/or Architecture (62 FR 33708) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected, and the heightened significance and standard of care for the NHL. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 National Register of Historic Places Nomination for the Cliff Walk

4.1.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to officially document the history and significance of the Cliff Walk as an individual historic property, which is located within the boundaries of the Bellevue Avenue Historic District. The Cliff Walk is a 3.5-mile, National Recreational Trail, which runs from First/Easton's Beach to Baileys Beach. The Cliff Walk is a public trail that features expansive views of the Atlantic Ocean, which are integral to the visual setting and visitor experience for this significant site. The trail also provides visitors views of some of the most prominent historic properties in Newport, including the Breakers, National Historic Landmark, Rosecliff, and Marble House, National Historic Landmark.

Listing properties on the NRHP not only documents the history of the area and specific properties but can help build community knowledge and pride. Nomination Forms can be used as educational tools for both the owners of the properties and the community as a whole and can help guide the future restoration and rehabilitation of the buildings. NRHP listing also allows properties to be eligible for state and federal grant funding and historic tax credit programs. NRHP listing does not place any restrictions on a property, nor does it prevent the remodeling or demolition of the building or allow for public access to the building. It does not in any way restrict the rights of the private property owner.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Research of available historic sources and existing documentation;
- Field survey, annotated photographs, mapping, and conditions assessments;
- Drafting of a NRHP Nomination Form to be distributed to the Participating Parties for review and comment;
- Development of a final amendment NHL Form which addresses comments from the Participating Parties;
- Distribution of the final NRHP Nomination Form to the Participating Parties; and

- Presentation of the final NRHP Nomination Form to the State Historic Preservation Office Review Board.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant selected will prepare a draft NRHP Nomination Form, prepared in accordance with applicable National Park Service and RIHPHC guidance. The draft document will include a description of the boundaries and property, a historic context and statement of significance, and all maps and photographs required by National Park Service (NPS) guidance. The draft NRHP Nomination Form will be distributed to the Participating Parties for review and comment. A final draft will be produced by the consultant that incorporates comments and additional information provided by the Participating Parties. The final document will be presented to the Rhode Island State Historic Preservation Office Review Board.

4.1.4 Standards

The project will comply with the following standards:

- The City of Newport Historic District Commission standards;
- The City of Newport Historic District Zoning, Chapter 17.80;
- The *Secretary of the Interior's Guidance on the Identification of Historic Properties* (36 CFR 800.4);
- The *Secretary of the Interior's Standards and Guidelines – Professional Qualifications Standards, for Archaeology, History, Architectural History and/or Architecture* (62 FR 33708);
- National Park Service's *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*;
- *National Register Bulletin 16a: How to Complete the National Register Registration Form* (NPS, 1997b); and
- RIHPHC guidance.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Preliminary Draft of the NRHP Nomination Form; and
- Revised draft of the NRHP Nomination Form.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Support the Development of a Resiliency Plan for the Cliff Walk

4.2.1 Purpose and Intended Outcome

Climate change, freeze and thaw cycles, winds, rains and other weather-related events have caused the deterioration and even the collapse of sections of the Cliff Walk in recent years. The purpose of this mitigation measure is to provide funding to support the City of Newport's existing initiative to prepare a Resiliency Plan (or similar) to develop measures that can be taken to maintain the setting and character of the Cliff Walk and ensure its long-term preservation. The plan will prioritize repairs and identify long-term resiliency solutions to protect the Cliff Walk for future generations of visitors.

The Cliff Walk extends approximately 3.5 miles along the eastern coastline of Aquidneck Island and the Bellevue Avenue Historic District, situated on the rocky outcrops of the shore and featuring expansive views of Easton Bay and the Atlantic Ocean (City of Newport, 2016). The Cliff Walk is part of the typical experience for visitors to the Newport mansions, is open to the public, and has been described as "Rhode Island's #1 tourist destination" with (reportedly) over 1.2 million visitors per year (Winthrop, 2021).

Portions of the Cliff Walk were washed away in Hurricane Sandy and were recently restored/rebuilt with grant funds from the RIHPHC and National Park Service (City of Newport, 2016; RIHPHC, 2019). More recently, on March 4, 2022, an approximately 20-foot section of the Cliff Walk collapsed, presumably due to ongoing erosion (Cozzolino, 2022; Dunning, 2022). Revolution Wind is aware that the City of Newport is actively working to prepare a "Cliff Walk Management Plan" (or similar), which is intended as a guide for best practices for operation and maintenance of this important community asset to respond to the threats posed by climate change (Dunning, 2022). The mitigation funding proposed by Revolution Wind is intended to support the City in their efforts to plan for the rehabilitation and preservation of this significant historic and recreational property.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Documentation of existing conditions, including mapping and photography;
- Research of available historic, scientific, and engineering sources and documentation;
- Research of current knowledge and scientific data related to coastal erosion resulting from climate change, including previous studies of shoreline change and the mechanisms of bluff erosion that have affected the Cliff Walk and may pose risks to long term preservation efforts;
- Consultation with the public and Participating Parties to identify priorities and concerns;
- Preparation of a draft Resiliency Plan, to be distributed to the Participating Parties for review and comment;
- Development of a final plan incorporating any comments received; and
- Distribution of the final plan to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release an RFP for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.2.2. Research on current environmental science, potential near-term and long-term threats to the property, relevant literature pertaining to historic preservation planning and climate change, and engineering solutions/physical improvements will be incorporated by the consultant into a Resiliency Plan. The draft plan will be developed in coordination with the public and Participating Parties to identify and prioritize short-term and long-term measures to enhance preservation outcomes based on reasonable forecasting of future environmental and climate conditions. The plan will then be distributed to the Participating Parties for review and comment. The final plan will incorporate any comments received and will be distributed to the Participating Parties.

4.2.4 Standards

The project will comply with the following standards:

- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- The 2017 *City of Newport's Comprehensive Land Use Plan*;
- The *City of Newport, Rhode Island Natural Hazard Mitigation Plan;*
- The City of Newport Department of Utilities guidance and regulations, as applicable;
- The City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable;
- The City of Newport Historic District Commission guidance and regulations, as applicable; and
- The City of Newport Building, Zoning, and Inspections guidance and regulations, as applicable.

4.2.5 Documentation

Proposed scopes of work, draft text, project plans and design specifications are to be provided for review by the Participating Parties.

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft of the Resiliency Plan; and
- Final revised Resiliency Plan.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Support On-Going Maintenance and Aesthetic Improvements to the Cliff Walk

4.3.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to provide funding for the implementation of resiliency measures, on-going maintenance, and/or aesthetic improvements to the Cliff Walk to ensure the long-term preservation of this historic resource. As described above in Section 4.2.1, Revolution Wind is aware that the City of Newport is actively working to prepare a Cliff Walk Management Plan, which is intended as a guide for best practices for operation and maintenance of this important community asset to respond to the threats posed by climate change (Dunning, 2022). The mitigation funding proposed by Revolution Wind is intended to support the City in their efforts to implement resiliency and maintenance measures to ensure the long-term preservation of this significant historic and recreational property.

4.3.2 Scope of Work

The scope of work will be determined in consultation with the Participating Parties but may include:

- Support ongoing maintenance of the Cliff Walk;
- Funds to support aesthetic improvements;
- Funds to support necessary rehabilitation to improve resiliency to storm events; and/or
- Funds to support expanded public interpretation of the Cliff Walk and risks/challenges posed by climate change.

4.3.3 Methodology

Revolution Wind will complete this scope using professionals currently involved in this work or hire additional specialists as required in consultation with the Participating Parties.

4.3.4 Standards

The project will comply with the following standards:

- The Newport Cliff Walk Commission;
- The City of Newport Building, Zoning, and Inspections;
- The City of Newport Historic District Commission; and
- The Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR 68).

4.3.5 Documentation

The documentation will be determined in consultation with the Participating Parties.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.4 Development of an Invasive Species Management Plan

4.4.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to provide an invasive species vegetation management plan for the historic properties of the City of Newport, with a focus on management of invasive species that threaten the historic character and ecology of the Cliff Walk and the historic properties identified in this HPTP. The intended outcome is to produce a guide for property owners to identify native and invasive species, their threats to historic building materials, historic character, and/or human health, and recommendations for the proper management of each species. Management of invasive species will improve the character and contribute to maintaining the integrity of the visual setting for these historic properties.

4.4.2 Scope of Work

The scope of work will consist of the following:

- Documentation of existing conditions and identification of current invasive species;
- Research of available historic, scientific, and horticultural sources and documentation;
- Research of current best practices relevant to historic gardening and modern horticulture;
- Consultation with the Participating Parties;
- Development of a draft Vegetation Management Plan to be distributed to the Participating Parties for review and comment; and
- A final plan to be distributed to the Participating Parties.

4.4.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.4.2. The consultant will identify, document, and research the existing invasive species in the area as well as available historic, scientific, and horticultural sources and documentation and best practices relevant to historic gardening and modern horticulture. The consultant will consult with the public and Participating Parties to identify concerns and priorities and develop a draft plan to be distributed for review and comment. The final plan will incorporate comments received and will be distributed to the Participating Parties.

4.4.4 Standards

The project will comply with the following standards:

- *Preservation Brief #36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes* (Birnbaum, 1994);
- The Alliance for Historic Landscape Preservation guidance, as applicable;
- The City of Newport Historic District Commission guidance and regulations, as applicable;
- The City of Newport Department of Planning & Economic Development guidance and regulations, as applicable; and
- The Secretary of the Interior's Standards for Treatment of Historic Properties (36 CFR 68).

4.4.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP.
- Draft Vegetation Management Plan; and
- Final Vegetation Management Plan.

4.4.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.5 Volunteer Ambassador Program

4.5.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to assist the Newport Cliff Walk Commission with the development of the Volunteer Ambassador Program as part of the Cliff Walk Together campaign which was launched in May 2021 (Winthrop, 2021). The program will help with the on-going maintenance and public appreciation of the Cliff Walk, which will help to ensure the long-term preservation of this property.

4.5.2 Scope of Work

The scope of work will consist of:

- Engaging with the Participating Parties to determine the program's needs;
- Developing list of program needs; and
- Providing support to the identified needs.

4.5.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.5.2. The preferred consultant should have demonstrated volunteer engagement and management experience to perform the scope of work. The exact scope of work will be determined in consultation with the Participating Parties.

4.5.4 Standards

The project will comply with the following standards:

- *Preservation Brief #36: Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes,* as applicable (Birnbaum, 1994);
- The Alliance for Historic Landscape Preservation guidance, as applicable;
- The City of Newport Historic District Commission guidance and regulations, as applicable;
- The City of Newport Department of Planning & Economic Development guidance and regulations, as applicable; and
- The Secretary of the Interior's Standards and Guidelines for Treatment of Historic Properties (36 CFR 68).

4.5.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Identified program needs; and
- Program support plan.

4.5.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.6 Mobile Application

4.6.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to undertake upgrades or additional content for the existing Cliff Walk mobile application[2], developed by the City of Newport in 2015, or to create a new mobile app for the Cliff Walk as determined in consultation with the Participating Parties. The intended outcome is to enhance the features and functionality of the mobile app by integrating artificial intelligence (AI) and/or historic photographs through QR codes or geolocations to show views of the changes over time both toward the land and the ocean and/or by adding additional locations/views as requested by Participating Parties.

[2] The Cliff Walk app: https://citimaps.com/events/newport-ri-sights-and-attraction/cliff-walk/

4.6.2 Scope of Work

The scope of work will consist of the following:

- Examination of the existing application;
- Determination of additional needs and requests for upgrades in consultation with the Participating Parties
- Research of available historic sources and documentation relevant to the relevant historic landscapes;
- Drafting of the application design in consultation with the Participating Parties;
- Beta testing of the application with the Participating Parties; and
- Launching of the finalized application incorporating comments received from the Participating Parties.

4.6.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.6.2. The preferred consultant will be a qualified software engineer or mobile application developer. The consultant will conduct all necessary research, consultation, and site visits to develop an application design, and develop a draft application design in consultation with the Participating Parties. The final application will be developed based on comments received from the Participating Parties.

4.6.4 Standards

The project will comply with applicable standards for mobile application development.

4.6.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Preliminary design of the application; and
- Final application design.

4.6.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Newport Historic Properties, January 25, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 19 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: HORSEHEAD/MARBELLA, TOWN OF JAMESTOWN, NEWPORT COUNTY, RHODE ISLAND

[Insert ATTACHMENT 19 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Horsehead/Marbella

Town of Jamestown, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Horsehead/Marbella
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HABS	Historic American Building Survey
HPTP	Historic Property Treatment Plan
LOC	Library of Congress
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft, applicant-proposed Historic Property Treatment Plan (HPTP) for Horsehead/Marbella which is listed on the National Register of Historic Places (NRHP) (hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (the Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

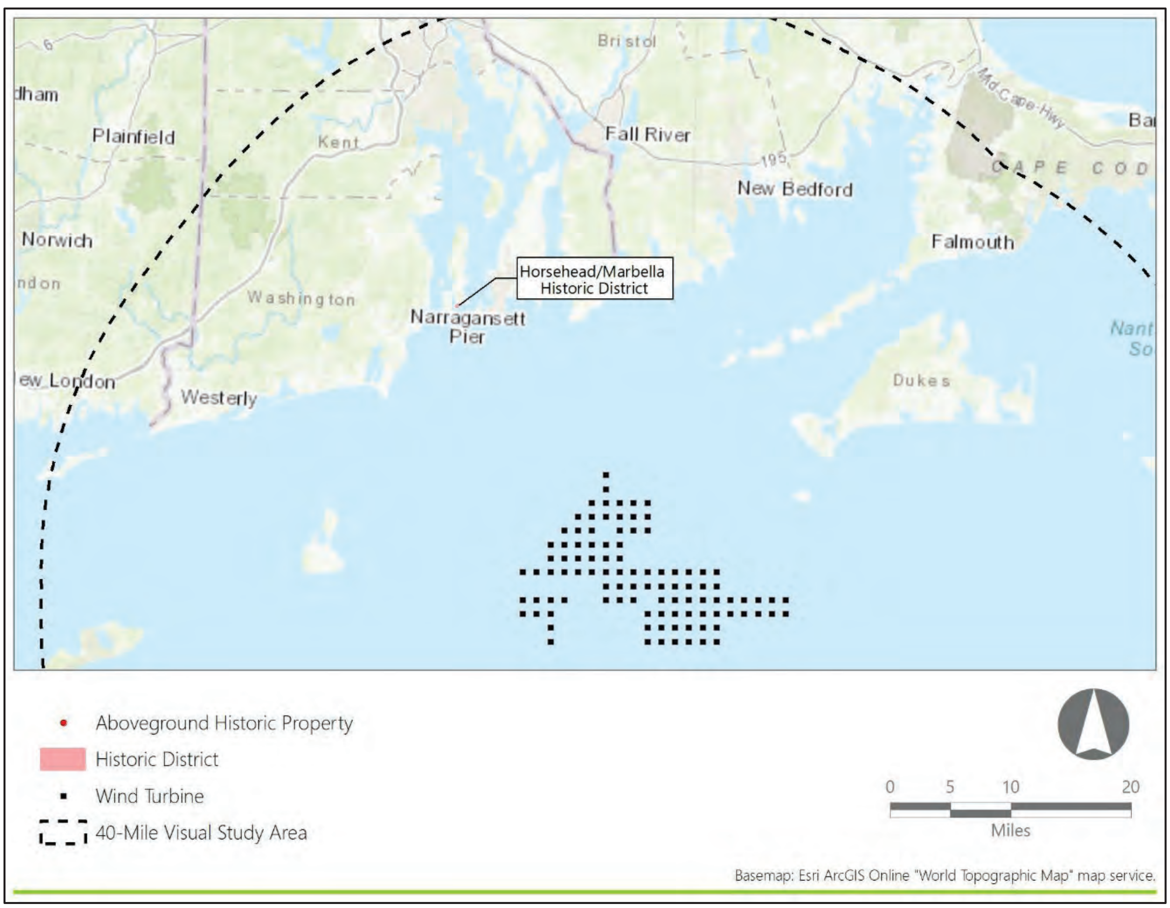
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Jamestown
- The Rhode Island Historical Preservation & Heritage Commission

Revolution Wind anticipates these parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

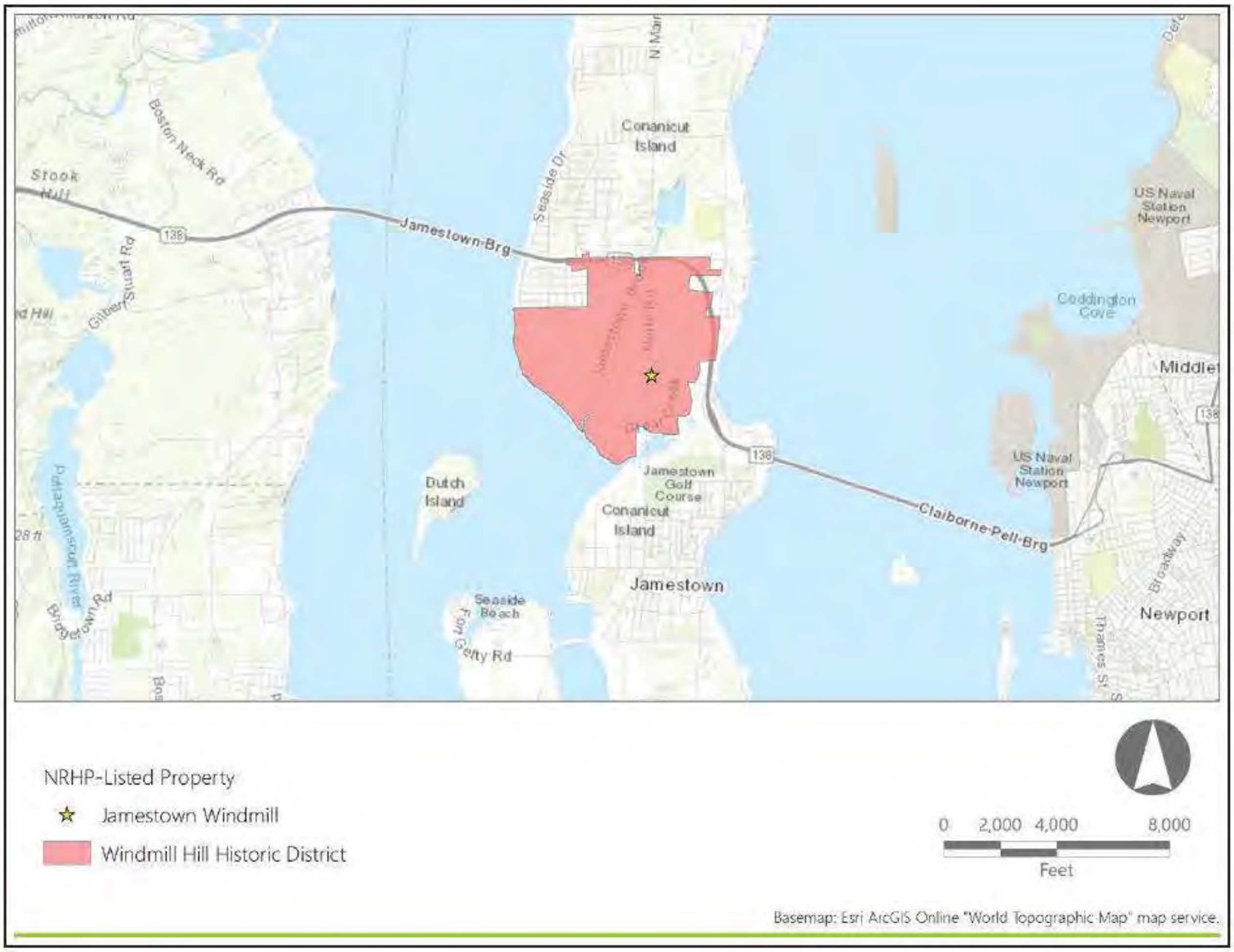
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Horsehead/Marbella	NRHP-Listed	Jamestown	RI	NR99000675(NPS)	Private	Estates and Estate Complexes

Figure 3.1-1. Historic Property Locations



In Section 3.3 the historic property is individually considered, described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

Horsehead/Marbella is included in the property type defined in the HRVEA as "Estates and Estate Complexes" consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer "cottages" built by wealthy industrialist families, drawn to the area as it became a prominent vacation and recreation area for the emerging American elite.

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

3.3 Horsehead/Marbella

3.3.1 Physical Description and Existing Conditions

Horsehead/Marbella is a shingle-style residence with a carriage barn located on Southwest Point in Jamestown, Rhode Island between Mackerel Cove and Concord Gulf Cove. The house is designed with granite ashlar laid in a random pattern on the first floor and the gable ends. The upper stories of the four-story tower and the western elevation are clad in wood shingles. The carriage house, located directly to the north of the main house, is designed in an L-shaped plan also with granite ashlar laid in a random pattern and the upper story clad in wood shingles (Wright, 1999). The property remains a privately-owned residence.

3.3.2 Historic Context

Horsehead/Marbella was constructed between 1882 and 1884 as a summerhouse for Joseph Wharton, co-founder of Bethlehem Steel and founder of the Wharton School of Business at the University of Pennsylvania. Wharton purchased the land in 1882 and the majority of the construction was completed in 1884; however, in 1885, Wharton purchased an adjacent property and in 1889-90 an addition was added to the western portion of the house (Wright, 1999). Charles L. Bevins, an architect from England, designed the home(Wright, 1999).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The property was listed on the NRHP in 1999 and is significant for its architecture, landscape architecture, and its association with the development of Jamestown as a summer resort as well as its association with American industry and society. As stated above, Horsehead/Marbella is located on Southwest Point between Mackerel Cove and Concord Gulf Cove with approximately one mile of coastline.

The house and carriage house are located on an elevated portion of the property to maximize water views. According to the NRHP Nomination Form, the house and carriage house were built into the side of the hill to enhance the buildings' relationship with the landscape and the tower was likely designed to mimic a lighthouse, possibly nearby Beavertail Light. The buildings were sited to create "long perspectives" that are "extremely picturesque" (Wright, 1999). Maximizing views and the property's relationship to the water are clearly evident by the placement of the buildings on the land and the design of the house.

4.0 MITIGATION MEASURES

Mitigation measures at the Historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic American Building Survey (HABS) Documentation

4.1.1 Purpose and Intended Outcome

The HABS program was founded in 1934 and is the oldest federal preservation program. The purpose of HABS is to document historic architecture through measured drawings, photography, and historical narratives. The documentation is maintained by the Library of Congress (LOC) and is available to the public in perpetuity.

As stated above, the significance of the property and landscape of Horsehead/Marbella was documented in 1999 in a NRHP Nomination form; however, this mitigation measure proposes to complete a more intensive, thorough documentation of the property. HABS documentation for Horsehead/Marbella will consist of measured drawings, including elevations, sections, and details of this historic property, prepared by a SOI Qualified Historic Architect per 36 CFR Part 61, as well as large-format black and white photographs, and a detailed history of the property to be kept in the LOC repository.

4.1.2 Scope of Work

This work will consist of the following:

- Archival research of the history of the property, including review of any existing architectural plans or drawings, articles, historic photographs, maps, building permits, etc.;
- Photographic documentation of the existing conditions of the structures and landscape to the Participating Parties for review and comment;
- Draft measured drawings of all structures on the property including individual drawings of all elevations and sections and detailed drawings of specific architectural features, as applicable to the Participating Parties for review and comment;
- Draft report of the history of the property to be provided to the Participating Parties for review and comment;
- Consultation with the Participating Parties and any relevant stakeholders;
- Develop the final HABS documentation, addressing any comments received, to be distributed the Participating Parties; and

- Submittal of the final documentation to the HABS Office per the HABS guidelines.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The preferred consultants will have experience in HABS documentation. The draft report, drawings, and photography will be completed by SOI Qualified Professionals per 36 CFR Part 61 in accordance with applicable National Park Service and HABS guidance. The draft documentation will be provided to the Participating Parties for review and comment. The final documentation will be prepared addressing all comments received and will be provided to the Participating Parties and to the HABS Office per the HABS guidelines.

4.1.4 Standards

The mitigation measure will align with the following:

- HABS Guidelines (HABS, 2020);
- The Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4); and
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft documentation; and
- Final HABS documentation.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required:

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Rhode Island Historic Properties, February 3, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 20 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE ABBOTT PHILLIPS HOUSE, THE STONE HOUSE INN, THE WARREN'S POINT HISTORIC DISTRICT, AND TUNIPUS GOOSEWING FARM, TOWN OF LITTLE COMPTON, NEWPORT COUNTY, RHODE ISLAND

[Insert ATTACHMENT 20 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Abbott Phillips House

The Stone House Inn

The Warren's Point Historic District

Tunipus Goosewing Farm

Town of Little Compton, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Abbott Phillips House, The Stone House Inn, and The Warren's Point Historic District Tunipus Goosewing Farm
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
DEIS	Draft Environmental Impact Statement
FEIS	Final Environmental Impact Statement

FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Abbott Phillips House, a Rhode Island Historical Preservation & Heritage Commission (RIHPHC) Historic Resource; the Stone House Inn, which is listed on the National Register of Historic Places (NRHP); the Warren's Point Historic District, which has been determined to be eligible for listing on the NRHP by the RIHPHC; and the Tunipus Goosewing Farm, which has been determined to be eligible for listing on the NRHP by the RIHPHC (the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (the Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

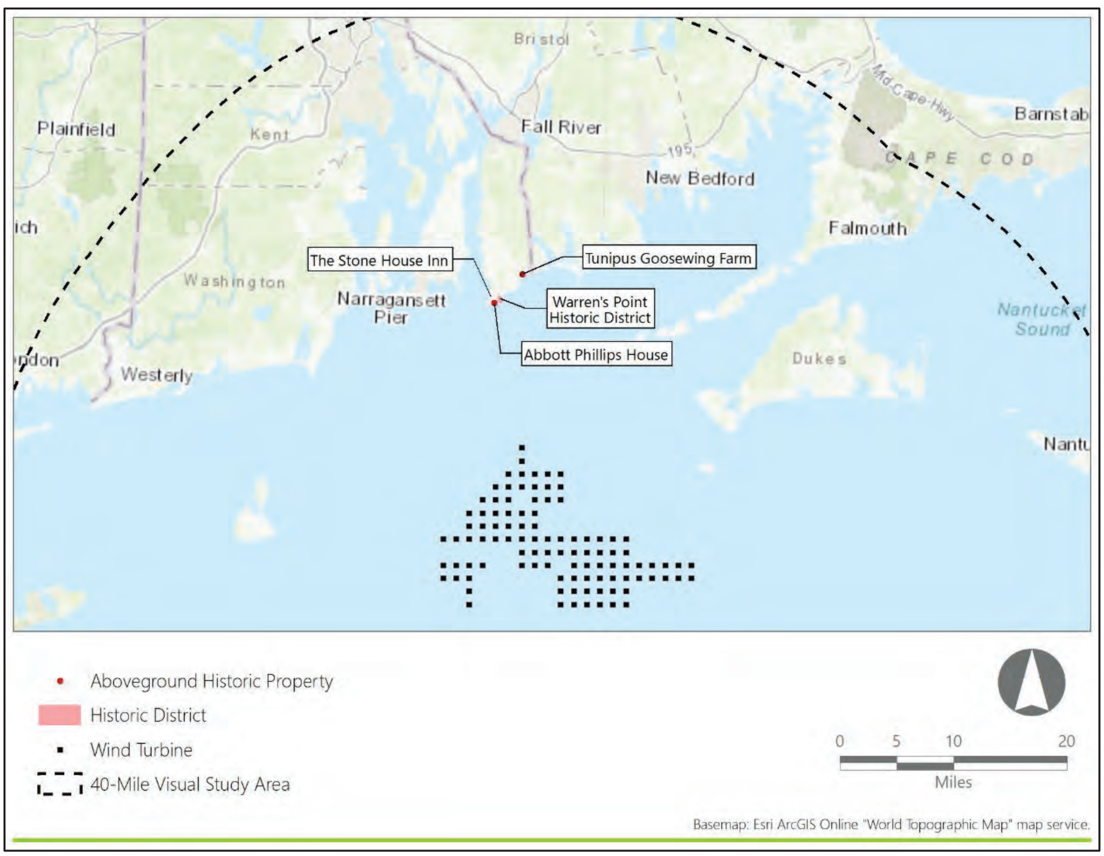
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Little Compton
- Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

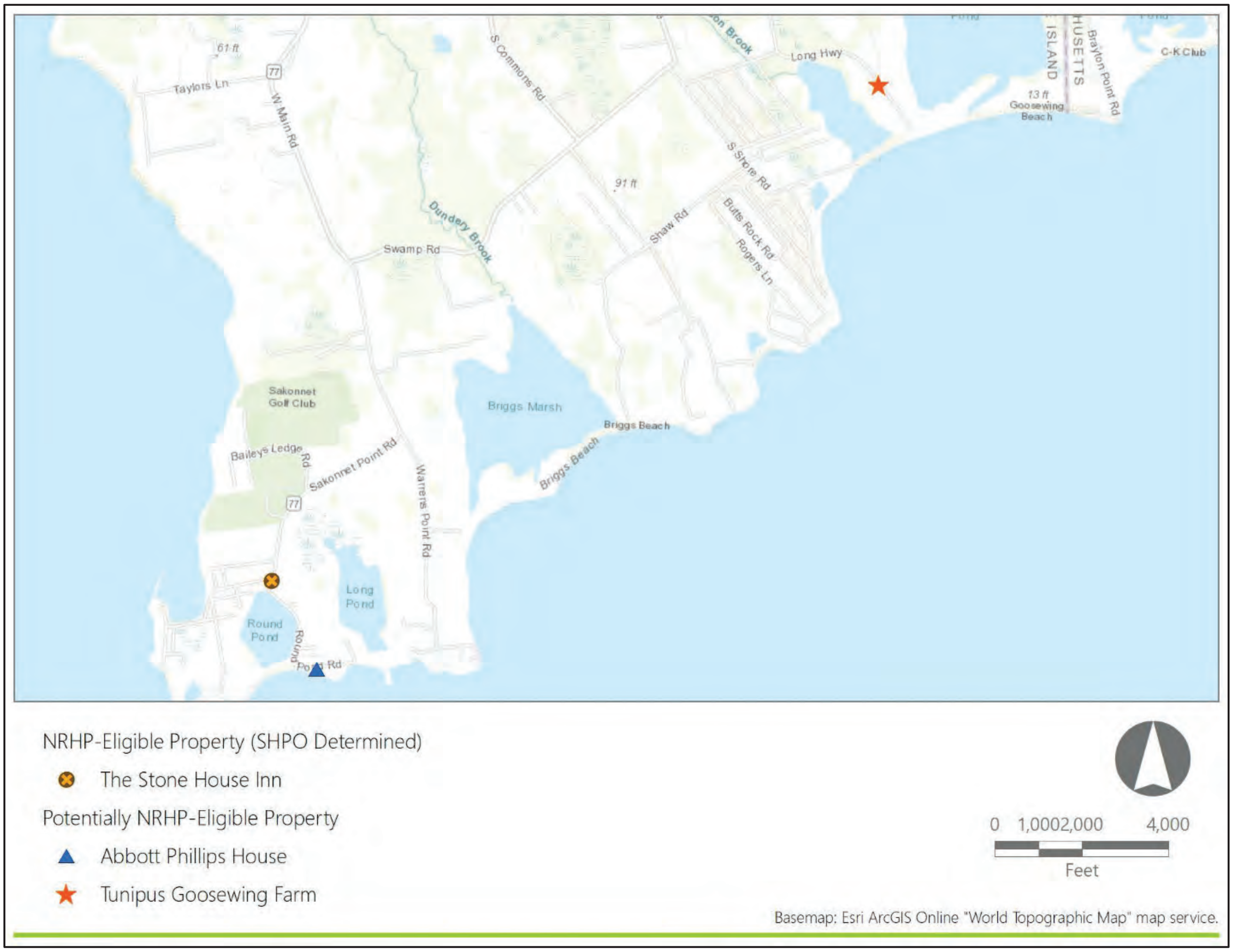
3.1 Historic Properties

This HPTP involves three historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
The Abbott Phillips House	RIHPHC Historic Resource	Little Compton	RI	827 (RIHPHC)	Private	Estates and Estate Complexes
The Stone House Inn	NRHP-Listed	Little Compton	RI	08NR00255 (NPS)	Private	Estates and Estate Complexes
The Warren's Point Historic District	NRHP-Eligible (RIHPHC Determined)	Little Compton	RI	835 (RIHPHC)	Private	Historic Buildings and Structures
Tunipus Goosewing Farm	NRHP-Eligible (RIHPHC Determined)	Little Compton	RI	831 (RIHPHC)	Private	Agricultural Properties

Figure 3.1-1. Historic Property Locations



In Sections 3.3 to 3.6, each of the historic properties is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA: "Historic Buildings and Structures," "Agricultural Properties," "Lighthouses and Navigational

Aids," and "Estates and Estate Complexes." Each property type is defined below as well as the characteristics typical of their maritime setting.

"Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the "Estates and Estate Complexes" property type (see below). These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Historic Buildings and structures occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

"Agricultural Properties" consist of historic farm buildings and landscapes which have retained a high degree of integrity and are generally no longer used for their original purpose. These above-ground historic properties feature barns, farmhouses, and may be associated with open tracts of pastureland or agricultural fields. Generally, these above-ground historic properties do not derive their significance in any direct way from the ocean or maritime activities.

Historic agricultural properties, including farms, farmhouses, barns and related buildings and structures are relatively common in the study area. Many of these properties were built between 1700 and 1850, after which agricultural economies in New England and New York declined sharply. The historic settings for such properties typically include open, agrarian landscapes which once may have afforded open views of the seas when sited along the shoreline or at higher elevations within the coastal interior. Few of the once expansive agrarian landscapes associated with the historic use of the region's farms survive. Some have been altered by later residential and commercial development and many have been transformed by reforestation. Despite these changes, historic agricultural properties remain an important part of the region's heritage and tangible expression of several centuries of intensive farming that transformed the landscapes throughout southern New England and eastern Long Island.

"Lighthouses and Navigational Aids" are defined by the historic associations with water-related transportation and defense, prominent views of the sea and dominance of the surrounding landscape, and common architectural forms. These structures present themselves as prominent and iconic features on the coastal landscape, possess elevated views of the ocean horizon, and are sited specifically for those elevated views.

Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid.

Estates and Estate Complexes" consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer "cottages" built by wealthy industrialist families, drawn to the vicinity of Newport, Rhode Island as it became a prominent vacation and recreation area for the emerging American elite, and to Montauk Point as a naturalistic and remote enclave.

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

3.3 The Abbott Phillips House

3.3.1 Physical Description and Existing Conditions

The Abbott Phillips House was built circa 1926-1927 by regional architect Albert Harkness (RIHPHC, 1990). It is sited at 97 Round Pond Road on a 1.8-acre lot, just north of Mill Point, at the Atlantic Ocean. The residence is one-and-one-half stories tall, and approximately 3200 square feet. Its massing is Z-shaped with a central main block (shingled, with mansard roof and hipped dormers), two gabled wings to either side, and a round stone entrance tower where the southern sections meet. The immediate landscape around the house has been cleared but the parcel retains woodlots as well.

3.3.2 Historic Context

Henry Tillinghast Sisson, son of industrialist David Sisson, served with distinction during the Civil War, and after his death was honored by construction of a statue to his memory in Union Cemetery, in the Town of Little Compton. He worked as a mill superintendent for A. & W. Sprague until 1873, then was elected to three terms as Rhode Island Lieutenant Governor. Returning to Little Compton in the late 1870s, Henry Sisson planned a seaside summer resort just north of Mill Point, featuring curving avenues and house lots. The project was never realized and only Round Pond Road itself remains as a remnant of his plans (RIHPHC, 1990).

Architect Albert Harkness of Providence designed the house at 97 Round Pond Road for Abbott Phillips, also of Providence, and a lawyer at the firm of Hinckley, Allen, Phillips & Wheeler. Phillips lived there with his wife and their four children (Little Compton Historical Society, 2020). It remains in use today as a private residence.

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Abbott Phillips House is significant under NRHP Criterion C for Architecture. An architectural survey of the building noted "the design of this house draws on sources in French provincial vernacular architecture; the image of picturesque domesticity that it creates was popular in the 1920s and 1930s" (RIHPHC, 1990).

Located on the southern coast of Little Compton, the Abbott Phillips house was designed intentionally with views toward the Atlantic Ocean. Though its significance is derived from the architectural merit of the residence, the location affords unobstructed maritime views from both the house and grounds.

3.4 The Stone House Inn

3.4.1 Physical Description and Existing Conditions

The NRHP-listed Stone House Inn (also known as the David Sisson House) was built circa 1854 at 122 Sakonnet Point Road in the Town of Little Compton. It is sited on a nearly 3-acre lot, facing south and overlooking Round Pond. The imposing stone residence is three-and-one-half stories tall and has an associated circa 1886 barn. The residence is seven bays wide and three bays deep, with a rectangular footprint. Modern replacement windows occupy each bay. A hipped slate roof features two dormers with paired arched windows. Between them is a large octagonal belvedere. An ornate, wood-framed, two-story wraparound porch is located at the south and west sides. Multiple wings extend from the rear of the building.

3.4.2 Historic Context

Providence-based industrialist David Sisson of the Fall River Ironworks commissioned a home at 122 Sakonnet Point Road (architect unknown) which was at the time the largest residence in Little Compton, and the only one constructed of stone (Connors, 2008). The house was passed to his son Henry (see Section 3.2.2 for information on H. Sisson) and following his Lieutenant Governorship, his family used the Stone

House as their primary residence. Financial difficulties resulted in the auctioning of the home in 1902 which marks the change of its use from single-family to inn, and interior renovations and stylistic updates occurred regularly over the past 170 years. An exception to its continual operation was a two-decade closure due to flooding resulting from the Hurricane of 1938 (Connors, 2008).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Stone House Inn is listed on the NRHP and is significant under NRHP Criterion C for Architecture. It was the largest single-family dwelling in Little Compton at the time of its construction, and the only one built of fieldstone. In addition, it derives significance from its use as an inn for the past century, the "only public accommodation for travelers in this intensely private seaside community almost exclusively dominated by single-family houses" (Connors, 2008). The Stone House Inn is sited 10 feet above sea level, at an inland location, with interior views of nearby Round Pond. However, the rooftop belvedere was a unique feature designed that affords farther views to the Atlantic Ocean.

3.5 The Warren's Point Historic District

3.5.1 Physical Description and Existing Conditions

The Warren's Point Historic District is located on Warren Point, in the southern portion of the Town of Little Compton east of Sakonnet Point, on the southeastern tip of an elevated, rocky peninsula. The point is bordered by the Atlantic Ocean to the east and south and Long Pond on the west. The district includes approximately 155 acres centered along Warren Point Road, which runs north-to-south and serves as a central axis for residential development. The area is characterized by large, affluent residences set on large lots, which are for the most open lawns, oriented to afford views of the adjacent waterbodies.

3.5.2 Historic Context

Warren's Point is located east of Sakonnet Point and Long Pond, first colonized by Nathaniel Warren in the seventeenth century. Developed as the Town of Little Compton's first summer resort colony in the 1880s, its picturesque homes were built by wealthy families from the northeast and Midwest, on land subdivided from the former Kempton Farm (RIHPHC, 1990). Presenting a cohesive aesthetic, the picturesque shingle-sided houses all shared views to the Atlantic Ocean. As time moved forward, so did architectural styles. New buildings of the Cape Cod and Modernist designs were added to the collection of residences at Warren's Point through the first half of the twentieth century. Regardless of architectural style, most buildings shared similar landscapes that included manicured lawns and stone walls. The neighborhood was designed as a quiet enclave for the enjoyment of idyllic ocean views. Public access was limited by privatizing streets which continue to operate in this manner.

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Warren's Point Historic District has been determined by RIHPHC to be eligible for listing in the NRHP under Criterion A for its association with the establishment of summer coastal resorts in Rhode Island, and under Criterion C for architecture, including residences that span a wide variety of architectural styles, constructed between 1880 and 1970 and retaining a high degree of integrity. The district is recommended as an appropriate candidate for nomination to the NRHP (RIHPC, 1990) and the *Town of Little Compton Comprehensive Plan* identifies the establishment of a voluntary historic district at Warren Point as a goal for the town relative to historic preservation (Town of Little Compton, 2018a:37).

By deed restriction, early purchasers of the property in Warren's Point were guaranteed overland access to Warren's Point Beach, ensuring a quiet, residential summer colony (Connors, 2008). It was this access and isolation that made Warren's Point a desirable oceanside retreat. Its visual and physical connection to the Atlantic Ocean is at the center of the significance of the district.

3.6 Tunipus Goosewing Farm

3.6.1 Physical Description and Existing Conditions

The Tunipus Goosewing Farm is located at 540 Long Highway on a peninsula an approximate 60-acre property between Quicksand Pond to the east, Tunipus Pond to the west, and the Atlantic Ocean to the south. According to the property card, the property currently contains a circa 1894 2-story, irregular-shaped house; two one-story circa 1999 guest houses, two one-and-a-half-story guest houses constructed circa 1815; and a circa 1850 two-story limestone, gambrel roof barn with an attached silo (Vision Appraisal, 2022). The property has been recently restored by the current owners (Morgan, 2016).

3.6.2 Historic Context

The Tunipus Goosewing Farm was constructed for the Sisson family, who moved to Little Compton from Newport in 1816 (RIHPHC, 1990). The property has remained an active farm since the eighteenth century. According to the *Historic and Architectural Resources of Little Compton, Rhode Island,* Lemuel Sisson raised cows on the property during the nineteenth century (Rhode Island, 1990).

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Tunipus Goosewing Farm is located on a peninsula overlooking Quicksand Pond, Tunipus Pond, and the Atlantic Ocean. The property also provides the only access to the town-owned Goosewing Beach. The farm has a strong maritime setting with views across the open agricultural fields to the water in three directions. The relationship of the fields, buildings, and structures on an elevated ridge to the surrounding waters is an integral part of the historic setting. The Tunipus Goosewing Farm is eligible for listing on the NRHP under Criterion A and C for its architecture and its association with the Sisson family and farming in Little Compton.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Climate Adaptation and Sustainability Plan for Historic Properties

4.1.1 Purpose and Intended Outcome

The *2018 Town of Little Compton, Rhode Island Local Hazard Mitigation Plan* identifies historic properties, including the three historic properties identified in this HPTP, as vulnerable to climate change and specifically events like flood, wind, hurricanes, and Nor'easters (Town of Little Compton. 2018b). In addition, goals of the *2018 Town of Little Compton, Rhode Island Comprehensive Plan* is to "maintain and protect the rural character, visual aesthetics and heritage of the town" as well as to "preserve buildings and sites of historic and cultural significance" (Town of Little Compton. 2018a). Many of the town's historic properties, including those addressed in this HPTP, are located along the shorelines of ponds and marshes or the Rhode Island coastline.

Prior to an event of destruction and damage resulting from a natural disaster, public engagement is needed to identify historic preservation priorities and goals, and long-range climate adaption measures that preserve the character and setting associated with historic properties. This HPTP proposes funding for the development of a Historic Preservation and Climate Adaptation Plan for the Town of Little Compton which will include public engagement to identify historic preservation and climate adaptation priorities and concerns of the local community. The intended outcome of this HPTP is to assist with the long-term preservation of the historic properties in the Town of Little Compton while addressing anticipated threats to historic resources and their setting from climate change.

4.1.2 Scope of Work

This work is anticipated to consist of the following:

- Review of existing town and county planning documents and regulations;
- Public outreach in order to identify historic preservation priorities and concerns;
- Photography and documentation (e.g. mapping) of existing conditions;
- Drafting of a historic preservation and climate adaptation plan for distribution to the Participating Parties for review and comment;
- Development of a final plan to include comments from the Participating Parties; and

- Distribution of the final plan to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The chosen consultant should have a demonstrated knowledge of climate change and the treatment of historic properties. Public engagement sessions will be held to solicit comments, questions, and concerns from the residents of the Town of Little Compton. The sessions will inform the preparation of the draft plan which will be distributed to the Participating Parties for review and comment. Additional sessions should be held as necessary to allow for public engagement. The comments shall be addressed and incorporated in the final document which will be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with following standards:

- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- The *2018 Town of Little Compton, Rhode Island Local Hazard Mitigation Plan;*
- The *2018 Town of Little Compton, Rhode Island Comprehensive Plan;*
- Town of Little Compton Planning Board guidance and regulations, as applicable; and
- Town of Little Compton Conservation Commission guidance and regulations, as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP; and
- Photographs and documentation of existing conditions.
- Draft hazard mitigation plan; and
- Final hazard mitigation plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Development of an Interpretive Exhibit/Signage at Goosewing Beach

4.2.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to use the information developed in the Climate Adaptation and Sustainability Plan to provide public education materials. The date developed will be used to produce text for signage at the town-owned Goosewing Beach, which is accessed by Tunipus Goosewing Farm. The signage will provide a brief history of the effects of climate change and storms on Little Compton as well as information on the risks of climate change to the town's coastline.

4.2.2 Scope of Work

This work will consist of the following:

- Research available historic sources and documentation relevant to the history of climate and weather in Little Compton;
- Consultation with stakeholders and the Participating Parties;
- Draft text and sign design to be provided to the Participating Parties for review and comment;
- Development of final text and signage design which addresses any comments received the Participating Parties; and
- Production of signage to be installed at Goosewing Beach in coordination with the Participating Parties.

4.2.3 Methodology

Revolution Wind will release an RFP for consultant services for the educational materials and select a consultant to perform the Scope of Work listed in Section 4.2.1.2. The preferred consultants will have experience in developing interpretive signage. The draft text and sign design will be developed in coordination with the Participating Parties and will distributed for review and comment. The final text and design will be produced by the consultant that incorporates further comments and any additional information provided by the Participating Parties. The final approved text will be included on the final signage. The installation of the signage will be coordinated with the Participating Parties.

4.2.4 Standards

The exhibit will conform to:

- Town of Jamestown Planning Commission and Zoning Board of Review guidance, as applicable;
- The National Park Service's *Wayside Exhibits: A Guide to Developing Outdoor Interpretive Exhibits,* as applicable (NPS, 2009), as applicable; and
- The National Park Service's *Programmatic Accessibility Guidelines for National Park Service Interpretive Media*, as applicable (NPS, 2012), as applicable.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft of the text and signage design;

- Final text and signage design; and
- Signage

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM’s release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Historic Context for Summer Cottage/Resort Development

4.3.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Little Compton. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.3.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;
- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.3.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.3.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.3.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

- The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will

[2] The timeline is subject to change and is based on current available information.

be completed within 5 years of the execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Rhode Island Historic Properties, February 3, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 21 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: NINE HISTORIC PROPERTIES, TOWN OF MIDDLETOWN, NEWPORT COUNTY, RHODE ISLAND

[Insert ATTACHMENT 21 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Nine Historic Properties

Town of Middletown, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Bailey Farm The Clambake Club of Newport Paradise Rocks Historic District Sea View Villa St. George's School: Church of St. George, Little Chapel, and Memorial Schoolhouse The Indian Avenue Historic District Whetstone The Land Trust Cottages The Bluff/John Bancroft Estate
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
DEIS	Draft Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
USCG	United States Coast Guard
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Bailey Farm, which is listed on the National Register of Historic Places (NRHP); the Clambake Club of Newport, which is listed on the NRHP; the Paradise Rocks Historic District, which is a Rhode Island Historical Preservation & Heritage Commission (RIHPHC) Historic Resource; the Sea View Villa, which is a RIHPHC Historic Resource; the St. George's School: Church of St. George, Little Chapel, and Memorial Schoolhouse, which is listed on the NRHP; the Indian Avenue Historic District which is listed on the NRHP; Whetstone, which is a RIHPHC Historic Resource; the Land Trust Cottages, which is a RIHPHC Historic Resource; and the Bluff/John Bancroft Estate, which is a RIHPHC Historic Resource, (the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (the Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2021) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context,

[1] The timeline is subject to change and is based on current available information.

the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

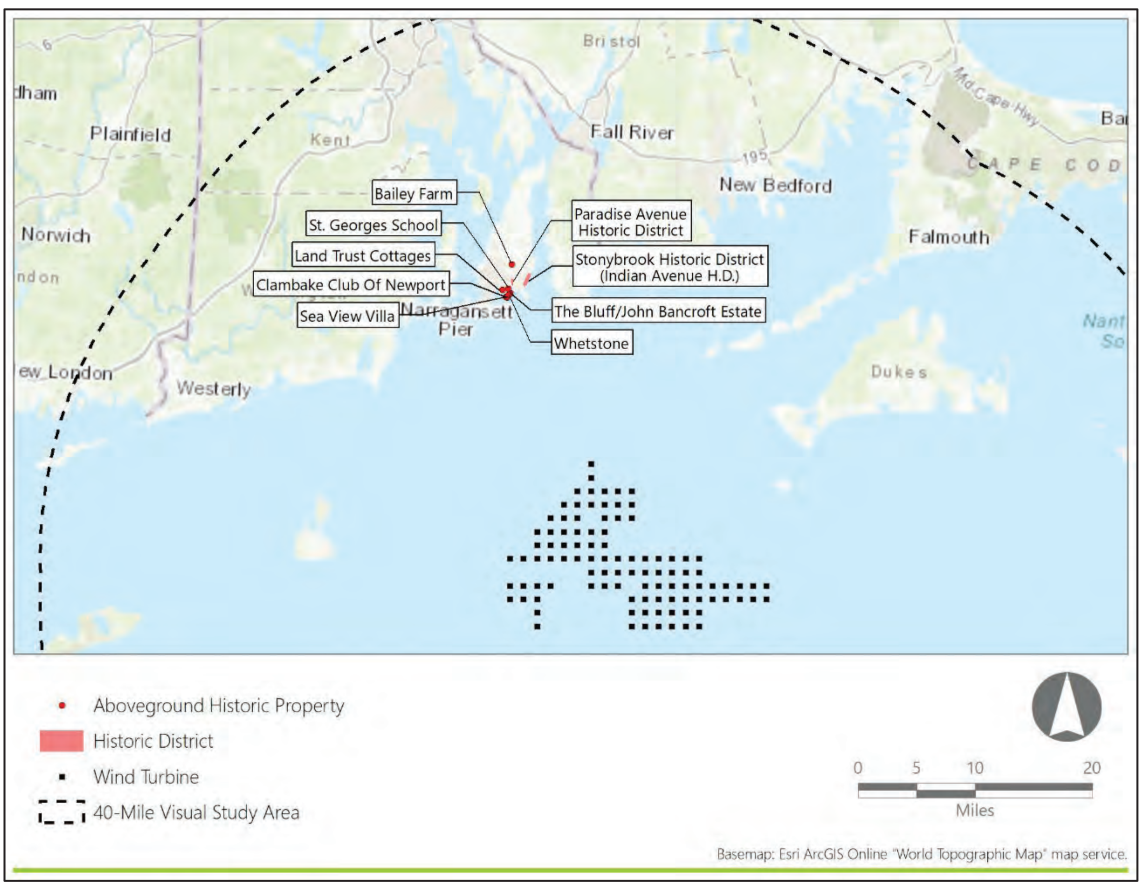
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- The Town of Middletown
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed party and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

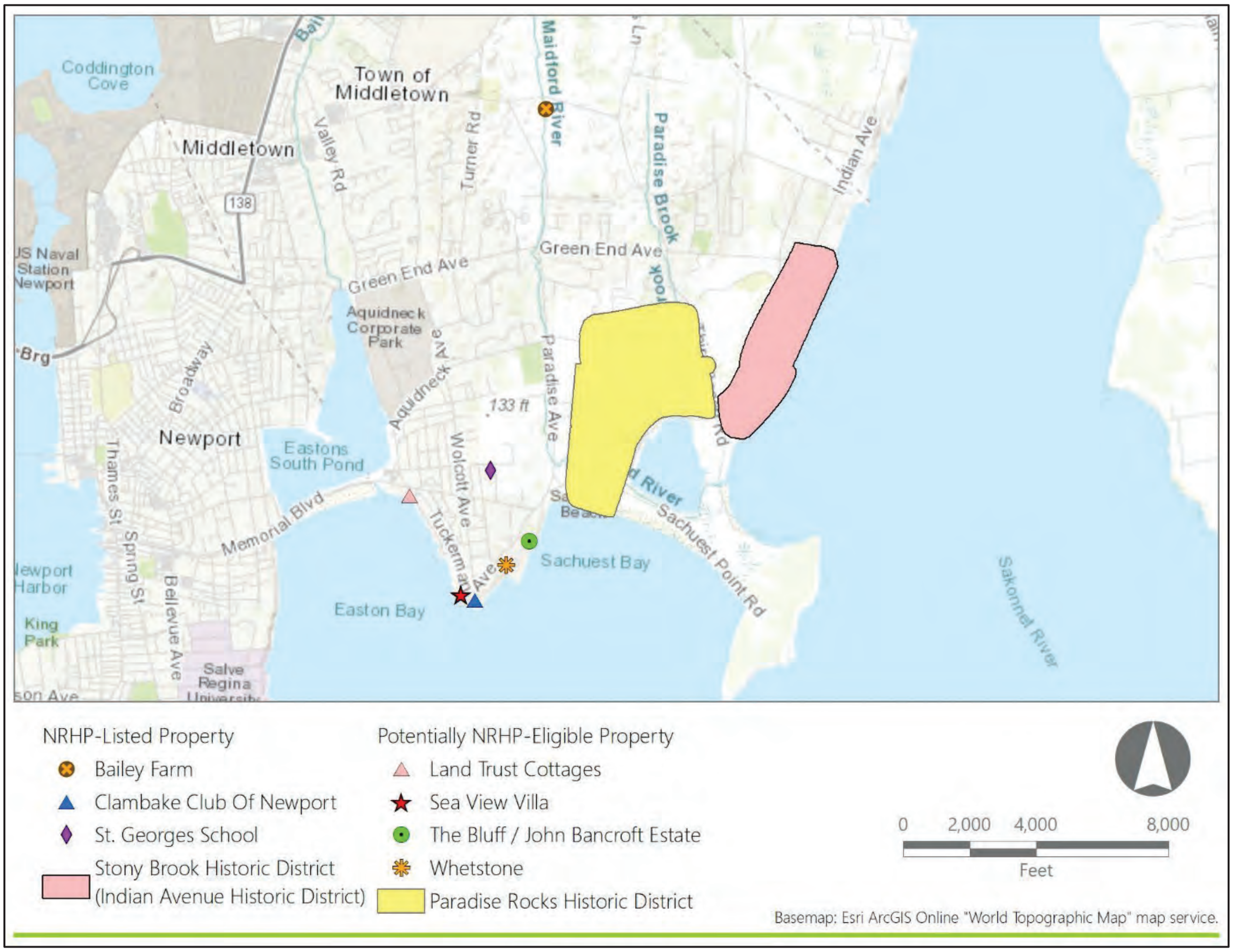
3.1 Historic Properties

This HPTP involves nine historic properties, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Bailey Farm	NRHP-Listed	Middletown	RI	84001887 (NPS Ref. #84001887)	Private	Agricultural Properties
Clambake Club of Newport	NRHP-Listed			95001267 (NPS Ref. #95001267)	Private	Recreational Properties
Paradise Rocks Historic District	RIHPHC Historic Resource			MT 4 (RI SHPO)	Private (Multiple)	Historic Buildings and Structures
Sea View Villa	RIHPHC Historic Resource			MT 75 (RI SHPO)	Private	Historic Buildings and Structures
St. George's School: Church of St. George, Little Chapel, and Memorial Schoolhouse	NRHP-Listed			4001235 (NPS Ref. #04001235)	Private	Historic Buildings and Structures
Indian Avenue Historic District	NRHP-Listed			9000708 (NPS Ref. #09000708)	Private (Multiple)	Historic Buildings and Structures
Whetstone	RIHPHC Historic Resource			MT 77 (RI SHPO)	Private	Historic Buildings and Structures
Land Trust Cottages	RIHPHC Historic Resource			903	Private	Historic Buildings and Structures
The Bluff/John Bancroft Estate	RIHPHC Historic Resource			MT 78 (RI SHPO)	Private	Estates and Estate Complexes

Figure 3.1-1. Historic Property Locations



In Sections 3.23 through 3.11, each historic property is individually considered, described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA: "Historic Buildings and Structures," "Historic Cemeteries and Burial Grounds," "Agricultural

Properties," "Recreational Properties," and "Estates and Estate Complexes." Each property type is defined below as well as the characteristics typical of their maritime setting.

"Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the "Estates and Estate Complexes" property type (see below). These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Historic Buildings and structures not fitting within the previously described types occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

"Historic Cemeteries and Burial Grounds" consists of cemeteries identified by federal, state, or local governmental agencies as having historic significance. These above-ground historic properties may be municipally owned cemeteries on public land, small family plots on private land, or abandoned burial grounds. Historic cemeteries are lasting memorials to the past, provide a guide to the changing values and composition of communities in the course of their historic development.

Historic cemeteries and burial ground vary throughout the study area. Small, private, non-denominational and family cemeteries were relatively common in New England, and many have survived to present-day. Many examples of small cemeteries were associated with specific farms or families and were frequently placed within the available agricultural lands surrounding a farmstead or near multiple associated family farms. Where such burial grounds are located near the water they may be associated with ocean or other maritime viewsheds, however, ocean vistas are less likely to have been a significant consideration in the siting of such cemeteries than their larger, more formal counterparts in the region. Where cemeteries are located within districts or other historic settlements strongly associated with maritime settings, such burial grounds may be sited to maintain a visual connection to the waters in order to maintain a sense of continuity linking the departeds' final resting places with the environment in which they lived. Cemeteries in urban locations expressing such patterns may include formal design elements associated with the "rural cemetery movement" of the 19th century, which sought to create naturalistic, park-like settings to express "an appreciation of nature and a sense of the continuity of life" (NPS National Register Bulletin 41: 6). Maritime views from hillside cemeteries that were intentionally incorporated or framed by landscape designs may be more sensitive to discordant modern elements than those associated with less formal burial grounds that may not have been specifically located to provide ocean views.

"Agricultural Properties" consist of historic farm buildings and landscapes which have retained a high degree of integrity and are generally no longer used for their original purpose. These above-ground historic properties feature barns, farmhouses, and large, open tracts of pastureland. Generally, these above-ground historic properties do not derive their significance in any direct way from the ocean or maritime activities.

Historic agricultural properties, including farms, farmhouses, barns and related buildings and structures are relatively common in the study area. Many of these properties were built between 1700 and 1850, after which agricultural economies in New England and New York declined sharply. The historic settings for such properties typically include open, agrarian landscapes which once may have afforded open views of the seas when sited along the shoreline or at higher elevations within the coastal interior. Few of the once expansive agrarian landscapes associated with the historic use of the region's farms survive. Some have been altered by later residential and commercial development and many have been transformed by reforestation. Despite these changes, historic agricultural properties remain an important part of the region's heritage and tangible expression of several centuries of intensive farming that transformed the landscapes throughout southern New England and eastern Long Island.

"Recreational Properties" is defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish. These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities.

The same macroeconomic trends that saw the decline of the quintessential New England farm in the mid-19th century are associated with a population shift to cities and rise in affluence for some segments of society. Summer resorts, supported by steamships, rail transportation, and eventually, automobiles were developed in numerous locations in the study area in the late 19th century. These resorts varied between properties intended to serve the rising group of "upper middle income" families living in the region's cities to estate-like developments serving a more affluent set. Seaside resorts, like many other shoreline recreational, commercial, and residential properties, were often sited to take advantage of aesthetically pleasing ocean or maritime views. Depending on location and the the conformation of the local shoreline, such properties may be associated with specific bay or cove viewsheds that include limited areas of the open ocean waters. Recreational activities at resorts frequently included swimming and designated beaches where residents and visitors may have spent considerable time during the summer months. Where these features are still present and express a tangible association with the historic resort property, views from beaches may be as important as views from more formal elements of the designed landscape. Likewise, historic hotels and inns became more common elements of the region's shoreline communities in the late 19th century. Such properties were often sited near harbors, ferry landings, rail stations, and public or private beaches and may be associated with similar historic maritime settings. Views to ocean waters or the more intimate bays and coves of the region may have been an integral part of the visitor's motivation for staying in such establishments. Such considerations can be expressed through the inclusion of building and landscape features clearly intended to afford views of ocean. Older taverns and inns in the study area may be found along the working harbors and ports and were intended to serve the fishing, whaling, and related participants in maritime commerce. The design and location of these properties may not show the same influence of aesthetic considerations but will likely also retain a strong association with the waterfront and maritime environment.

"Estates and Estate Complexes" consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer "cottages" built by wealthy industrialist families, drawn to the vicinity of Newport, Rhode Island as it became a prominent vacation and recreation area for the emerging American elite, and to Montauk Point as a naturalistic and remote enclave.

Estates built by or for wealthy families have been part of the region's landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

3.3 The Bailey Farm

3.3.1 Physical Description and Existing Conditions

The Bailey Farm (NPS Ref. #84001887, originally inventoried as the Chapman House and Farm) is an approximately 47-acre farm located at 373 Wyatt Road in Middletown, Road Island, approximately 2.25 miles from the coastline in Sachuest Bay (Figure 3.1-1). The property consists of a central, main farm complex including the original farmhouse, a barn, associated outbuildings including sheds and garages, and a cistern. The fields surrounding the central farm complex are still in use (predominantly as a vineyard) and are bound and interlaced with dry-laid stone walls. The Bailey family burying ground is located in the northwestern corner of the parcel, partially enclosed by a stone wall and modern metal fence. The Maidford River (a small brook) runs north to south, bisecting the property immediately west of the central farm complex (Nebiker et al., 1984; RIHPC, 1979a:40).

A more modern house (constructed circa 1930) with associated outbuildings is located in the northwestern corner of the property north of the Bailey family burying ground but does not contribute to the historical significance of the Bailey Farm (Nebiker et al., 1984).

The frame of the Bailey farmhouse dates from the mid-eighteenth century but was renovated in the nineteenth century Greek Revival style, including a large brick center chimney and three-bay façade. The outbuildings date from the mid-nineteenth to early-twentieth century (likely replacements for earlier barns and sheds) and have gabled roofs, but have been updated with modern shingles, windows, and fixtures (such as solar panels). Though the outbuildings have been updated and/or replaced, they retain their original placement and orientation to the road and the surrounding landscape (Nebiker et al., 1984).

3.3.2 Historic Context

The Bailey Farm was once a farmstead occupying as much as 100 acres that was owned and occupied by the Bailey family, who were settlers of nearby Newport, throughout the eighteenth and into the nineteenth century. When the farmhouse underwent its Greek Revival renovations in 1838 the property was owned by Easton Bailey. The property was sold by the Bailey family in the 1850s and was bought and sold several times before being purchased by Peleg Sherman in 1878. His family owned the land until 1918, until it was sold to the Nunes family, whose descendants still owned the property at the time of the Bailey Farm's nomination for the NRHP in 1979. In the year 1850, under the operation of James Gardiner, the Bailey Farm produced \$200 worth of fruits and vegetables, and \$210 worth of meat, marking a relatively prosperous operation compared to other Rhode Island hill farms (RIHPC, 1979b; RIHPC, 1979a:40; Nebiker et al., 1984).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The NRHP-listed Bailey Farm meets Criterion A for its associations with the nineteenth-century agriculture of island farms of Narragansett Bay and NRHP Criterion C for its importance as an example of architecture and engineering of the Greek Revival, with a period of significance from 1825-1849 (Nebiker et al., 1984). The Bailey Farm was listed on the NRHP in 1964 and enjoys views to Sachuest Bay.

3.4 The Clambake Club of Newport

3.4.1 Physical Description and Existing Conditions

The Clambake Club of Newport is a one-story building located on the bluff at Easton Point. It is a wood-framed, wood-shingled structure laid out in a L-shaped plan. Each wing is covered by a gabled roof, with cedar shingles, punctuated by large stone chimneys. Horizontal cedar-board siding covers the exterior. Several minor additions protrude from the sides of the original building. Areas of exposed foundation show a mix of irregularly cut stone and/or stucco. On the south side of the structure, which drops off to the water, the building is supported by masonry piers (Werenfels, 1995; RIHPC, 1979b:34).

The main entrance on the north side of the structure is cross-gabled, with an arched fan-light window above the wood-paneled entrance door. Stone piers support a flat roof outside the main entrance. The south side of the structure is characterized by a series of enclosed porches. The porches all have an arrangement of large viewing windows that offer views of the Rhode Island Sound. The porch at the western end of the south side of the structure has a stone terrace outside (Werenfels,1995).

Two outbuildings are also located on the property, the Chef's Cottage and the Guest Cottage. The Chef's Cottage is a small, wood-framed, one-story building with a gabled roof on the north end of the property. The exterior of the Chef's Cottage is also covered in horizontal cedar-board siding. The roof is made of asphalt shingles. The Guest Cottage is a small, wood-framed, one-story building with a gabled roof located on the western end of the property. The Guest Cottage has a gabled entrance portico, and a large bay window facing the Rhode Island Sound to the south. The exterior to the Guest Cottage is covered in horizontal cedar-board siding, and has a cedar shingle roof (Werenfels,1995).

3.4.2 Historic Context

The Clambake Club of Newport has occupied the site at Easton's Point since the 1890s, officially organizing as a club to utilize the property in 1895. An existing dwelling and stable on the property were improved upon beginning in 1897 when the entered into a formal rental agreement with the owner of the property. In 1903 the Clambake Club of Newport property was purchased by founding member Center Hitchcock, who constructed the first clubhouse facility specifically built for the Clambake Club's activities sometime between 1903 and 1907. Club records indicate the facility was likely designed by Colonel Francis Hoppin. A photograph from 1910 shows a simple, one-story building with gabled roofs (Werenfels, 1995).

The original building (with some small additions) survived until September 21, 1938, at which time a hurricane destroyed portions of the building on its southern and eastern ends, though the main body of the building survived the storm. The club was rebuilt in 1939 by William L. Van Alen of Wilmington, Delaware, though it is unclear how much of the original structure was incorporated into the design of the new building. However, the simple, one-story gabled-roof character of the building remained the same (Werenfels, 1995; RIHPC, 1979b:34).

The two outbuildings are not depicted on the 1921 Sanborn Map Co. *Atlas of Newport, Jamestown, Middletown and Portsmouth, Rhode Island* (Sanborn, 1921) and it is unclear if they existed before the 1938 hurricane or if they were later additions to the property (Werenfels, 1995).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Clambake Club of Newport is significant under NRHP Criterion A for its associations with the late nineteenth-century and early twentieth century entertainment and recreation movements, specifically the seaside recreational facilities on Rhode Island and New England coastlines used for clambakes, social gatherings, and sporting activities such as fishing and shooting. The Clambake Club of Newport has a period of significance from 1875-1949 and is still in use as a private club today (Werenfels, 1995). The location of the main building, and both outbuildings speak to the property's historic association with views to and enjoyment of the seascape. Large bay windows and multiple porches extending towards the water show the importance of the ocean views and the immediate proximity of the waterfront to the historical character of the property. It was listed in the NRHP in 1995.

3.5 The Paradise Rocks Historic District

3.5.1 Physical Description and Existing Conditions

The Paradise Rocks Historic District is located at the south end of Middletown, to the north of Gardiner Pond and Second Beach. According to the Rhode Island Historical Preservation & Heritage Commission (1979a:17), "On an island devoted largely to agricultural, residential, commercial, and industrial uses, the Paradise Rocks area is a superb and unique natural enclave." The Paradise Rocks Historic District is a largely undeveloped area, with portions of the district set aside as wildlife sanctuaries. The district encapsulates Nelson Pond and Paradise Brook, and is named for Paradise Rocks, a north-south trending outcropping of fine blue-hued conglomerate rock" (RIHPC, 1979a:2). The Paradise Rocks Historic District consists of several resources, both natural and man-made. These include Hanging Rock, the Smith-Gardiner-Norman Farm, Gray Craig Estate, the Allen-King-Norman Farm, and the Norman Bird Sanctuary and Museum. The history of each resource is described in the following section.

3.5.2 Historic Context

For most of its history, the area within Paradise Rocks Historic District was left it its natural state. Unlike the surrounding area (i.e., Stonybrook Historic District), the District did not become a location for numerous sprawling summer estates. During the nineteenth century, the area was utilized for agriculture and hunting. By the twentieth century more "passive recreation" was enjoyed in the bird sanctuary, with only several residences constructed (RIHPC, 1979a:17). A description and history of some of the resources within the District is listed below.

Hanging Rock
Hanging Rock is a conglomerate-rock mass near Second Beach that juts out into a marsh, with an abrupt cliff-like break at its south end. According to the Rhode Island Historical Preservation & Heritage Commission, (1979a:17-18), the rock was also known as "Berkeley's Seat" during the eighteenth century, as it was a favorite location of Bishop George Berkeley. Today, it is a popular tourist attraction.

Smith-Gardiner-Norman Farm (Paradise Farm)
The Smith-Gardiner-Norman Farm is an NRHP-listed historic district located on 129 acres. The property consists of a mid-eighteenth-century farmhouse with later additions, a mid-nineteenth century barn, two agricultural outbuildings, two burial sites, a stone-lined sheep pen, stone-lined pastures and fields, wooded areas, Hanging Rock, and an abandoned bluestone quarry. The farmhouse consisted of a two-and-a-half story structure rebuilt in the late nineteenth century in the Colonial Revival style. According to the Rhode Island Historical Preservation & Heritage Commission (1979a:18), the farmhouse had a gambrel roof, two interior brick chimneys, a central entry with sidelights in a veranda, gable dormers in front, and a flat roof addition.

The property was primarily farmed by tenant farmers from 1850 to 1900. However, it was best known as the summer residence of George H. and Abbie Kinsley Norman who bought the property in 1898. Mabel

Norman Cerio, the last private owner of the Smith-Gardiner-Norman Farm, adapted the farmhouse and immediate neighboring fields for use as a main residence in 1915. Cerio bequeathed much of the estate to the Norman Bird Sanctuary Trust for use as a bird sanctuary in 1949, which continues to be its use today. At the time of Cerio's death, a 16-acre parcel comprising the Paradise Farmhouse, outbuildings, and agricultural fields along Third Beach Road remained in the hands of the Norman heirs. Various fields were leased for commercial use until the 1990s. In the late 1990s, the Norman Bird Sanctuary purchased this parcel and reintegrated it into the sanctuary (Town of Middletown, 2015).

Gray Craig

Gray Craig, also known as the Michael M. Van Bueren House, was once the farm of one the earliest families in Middletown during the eighteenth century. The resource as it exists today consists of a large two-and-a-half story stone house with four chimneys and views of Sachuest Beach and the Atlantic Ocean. Updates were made to the estate by Mary and Michael Van Bueren during the early twentieth century to transform the estate into a chateau-like house. Additions included kennels, greenhouses, a walled and secret garden, a tea house, a gatehouse, a stable, and a barn (RIHPC, 1979a:18).

Allen-King-Norman Farm

The Allen-King-Norman Farm consists of a two-and-a-half story Federal-era structure with large brick and central chimneys. According to the Rhode Island Historical Preservation & Heritage Commission (1979a:18), the farmhouse had a central portico entry in a 5-bay, south-facing façade, and a large wing at a right angle at the rear. There was a complex of wood-shingle and stone outbuildings at the rear, and the grounds, with stone walls, were well landscaped. The farm was opened to the public as a bird sanctuary in 1950 and named for George H. Norman and George H. Norman, Jr.

Norman Bird Sanctuary and Museum

The Norman Bird Sanctuary, maintained by the Rhode Island Audubon Society, opened to the public in 1950 and consisted of a 450-acre tract of woodland, field, marshes, and rocky hills. Portions of the Sanctuary was formed from the Smith-Gardiner-Norman Farm and Allen-King-Norman Farm. A converted barn and several small outbuildings serve as the headquarters which comprise the bird sanctuary (RIHPC, 1979a:18).

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Paradise Rocks Historic District is an NRHP-eligible resource, possibly under Criterion A and C. The district contains a typical landscape within coastal New England and Middletown that was utilized for agriculture by Europeans for over 200 years. In addition, the few houses within the district are typical examples of nineteenth century residences within Middletown, Rhode Island, embodying the distinctive characteristics of the type, period, or methods of construction. The homes are also in keeping with the vernacular building tradition of coastal New England.

One of the resources within the District, the Smith-Gardiner-Norman Farm (also known as Paradise Farm), was listed in the NRHP under Criterion A and C for its significance in the history of Middletown's settlement and agriculture. According to the NRHP Inventory Nomination Form (Connors, 2007), the Paradise Farm is "a well-preserved example of Rhode Island's eighteenth and nineteenth century island farms, typical of its region in its form and in its history of use and ownership until the early twentieth century." Contributing structures included a farmhouse, a two-car garage, carriage shed, barn, stone walls, agricultural fields, orchard, family garden, sheep pen, Gardiner Family Burial Plot (1786-1872), gravesite (date unknown), Hanging Rock, and quarry. The period of significance for the Farm spans from 1750 to 1949. While the early period's significance included the history surrounding the historic farmstead, the later period's significance included the pattern of development in the history of the island towns and the use of agricultural areas in island towns as country retreats for wealthy families. The Smith-Gardiner-Norman Farm may also be NRHP eligible under Criterion D, as it may yield evidence about the lifeways of coastal Native Americans as well as successive owners, tenants, and slaves (Connors, 2007).

3.6 The Sea View Villa

3.6.1 Physical Description and Existing Conditions

The Sea View Villa is a two-and-a-half story, multi-gabled chateau with a complex plan, several porches, and wood-carved details on the exterior (RIHPC, 1979a:34). The house is near the vicinity of Easton's Point on Tuckerman Avenue. The house is less than 100 meters from the shoreline and approximately 40 feet above mean sea level, overlooking the Atlantic Ocean. Sea View Villa is currently a privately owned apartment complex (Sea View Villa, n.d.).

3.6.2 Historic Context

The Sea View Villa was built by General Zachariah Cantey Deas in the 1880s. The original lot, much like those in other sections of Middletown, were laid out by a syndicate of Boston businessmen. In 1945, the property was purchased by Tony and Mary Spiratos, whose family continues to own the property. During this time, Sea View Villa was host to President Eisenhower's Cabinet and the White House's staff. During the latter half of the twentieth century and to the present, the Spiratos family made major renovations to the estate, updating the various rooms (such as the old servant's quarters) into apartments for rent (RIHPC, 1979a:6; Sea View Villa, n.d.).

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Sea View Villa is an NRHP-eligible resource and appears to meet Criterion C. The house is a typical example of a late-nineteenth century residence within Middletown, Rhode Island, embodying the distinctive characteristics of the type, period, or methods of construction. In addition, the house is in keeping with the vernacular building tradition of coastal New England. The property's natural landscape and maritime visual residence.

3.7 The St. George's School: Church of St. George, Little Chapel, and Memorial Schoolhouse

3.7.1 Physical Description and Existing Conditions

The St. George's School (NPS Ref. #04001235) collectively refers to three buildings (attached to one another) together occupying less than one acre on a 125-acre school campus: the Church of Saint George, the

Memorial Schoolhouse, and the Little Chapel. Approximately 50 other structures, as well as lawns and athletic fields, cover the rest of the campus. Approximately half of the other structures were built between the 1880s and 1930s; some of those may also warrant NRHP nomination. The Memorial Schoolhouse, Church of Saint George, and the Little Chapel occupy the center of the campus between landscaped courtyards. The entire campus has been likened to an English manor estate, with buildings consistently between one and three stories, with gabled roofs, red brick exteriors, and Georgian Revival and Tudor Revival architecture (Cavanaugh, 2004: Section 7, pg. 1-2).

While the original campus was laid out in quadrangles, preserving ocean views to the east and south was later considered. The hilltop location of the school property offers "magnificent views of Second Beach, Sachuest Bay, Rhode Island Sound" and other landmarks (Cavanaugh, 2004: Section 7, pg. 1). Currently, the school serves as a private, Episcopal, coeducational boarding school (St. George's School, n.d.).

The Little Chapel

The Little Chapel is a brick one-room building with one-story, and a gabled roof of green slate on a poured concrete foundation. Constructed between 1909 and 1911, the Tudor Revival style building was relocated in 1924 less than 100 feet away from its original site to make way for construction of the Church of Saint George. The Little Chapel is now attached to the larger Church of Saint George on the larger structure's southeast corner in the position of a Gothic church's "Lady Chapel." The Little Chapel was modified between 1924 and 1928 to match the style of the Church of Saint George. The Little Chapel now exhibits a parapeted gable roof, Gothic pointed-arch doorway, diamond-paned leaded casement windows, and exposed roof beams and trusses. At the time of its inclusion on the NRHP, the slate roof and gutters of the Little Chapel were in disrepair (Cavanaugh, 2004: Section 7, pg. 3-5).

The Memorial Schoolhouse

The Memorial Schoolhouse is a two and one half-story red brick building built in the Tudor Revival style. It was constructed between 1921 and 1923 as a memorial to the alumni of the school who died in World War I. It has cast stone trim, a multi-gabled slate roof, and a wood-framed cupola. The main entranceway is semi-hexagonal with an arched doorway and Renaissance detailing. A miniature turret is adjacent to the north slype door. The schoolhouse is oriented on and east-west axis, and its primary façade faces the south. The schoolhouse is in very good condition, and retains full integrity of setting, feeling, and association (Cavanaugh, 2004: Section 7, pg. 6-11).

The Church of Saint George

The Church of Saint George was constructed between 1924 and 1927 by one of the major church architects of his generation, Ralph Adams Cram of the Boston firm of Cram & Ferguson. According to the St. George's School NRHP registration form, "the Gothic Revival Style Church of St. George (commonly referred to as "the Chapel") is not only the most visually prominent, but also the most historically and architecturally significant building on campus" (Cavanaugh, 2004; Section 7, pg. 12).

While notably smaller than medieval period counterparts, the Church of Saint George presents the Gothic feelings of height and weightlessness. Character defining features include: the stone materials; the buttresses; the rib-vaulted roof; the pointed-arch window and door openings; the stained-glass windows outlined with stone tracery; the cloister with its fan-vaulting, pointed arches and stone tracery; the great tower; and the copious ornamentation inside and out (Cavanaugh, 2004: Section 7, pg. 12).

The Church of Saint George was constructed primarily of gray limestone, with areas of marble, granite and limestone interior. The roof is lead coated copper. The church is arranged in a T-shape, with a long nave running east-west and a short transept at the west end. The nave and the transept have end-gabled roofs. The church has four exterior towers, with the largest square tower rising 147 feet. A long, narrow, two-story stone structure called a slype connects the church with the Memorial Schoolhouse (Cavanaugh, 2004: Section 7, pg. 12).

3.7.2 Historic Context

The St. George's School was founded as an Episcopal school for boys in 1896 by Mr. John Byron Diman, a deacon in the Episcopal Church and alumnus of Brown, Cambridge, and Harvard. At the time, Rhode Island did not have a state-supported public high-school system, so the St. Georges School filled the need for private education. Originally the school rented a location in Newport, before relocating in 1901 to the present-day location due to Diman's love of the "rural, naturalistic qualities and extensive ocean views" (Cavanaugh, 2004; Section 8, pg. 45). By 1906 the school had 88 students, and construction of new campus buildings included classrooms, dormitories, residences, a dining hall and other supporting facilities. The Little Chapel was constructed between 1909 and 1911 to serve as a place for morning communion services, confirmation classes, Bible study, and community meetings. The Memorial Schoolhouse, constructed between 1921 and 1923, was built to memorialize those school alumni who had died in World War I. The Church of Saint George, constructed between 1924 and 1928, was built to provide religious services to the entire Episcopal community of St. George's School (Cavanaugh, 2004: RIHPC, 1979a:31).

3.7.3 NRHP Criteria and the Maritime Visual Setting

The St. Georges School is significant under NRHP Criterion A for reflecting the rise of faith-based private education in America, particularly of Episcopal boarding schools in New England, at the end of the 19th century and the beginning of the 20th century. Collectively and individually, the three buildings which comprise the NRHP listing are also significant Under Criterion C. The Little Chapel and the Memorial Schoolhouse both represent the Tudor Revival style. The Church of St. George is a masterpiece of English Gothic Revival ecclesiastical architecture, representing the work of one of the major church architects of his generation, Ralph Adams Cram of the Boston firm of Cram & Ferguson (Cavanuagh, 2004: Section 8, pg. 33).

The extensive and magnificent ocean views contribute to the St. George's School's integrity of setting, feeling, and association as they were a primary reason that founder John Diman chose the location. Layout and orientation of the campus buildings in relation to the east and south facing views was also considered during construction. The St. George's School was listed in the NRHP in 2004.

3.8 The Indian Avenue Historic District

3.8.1 Physical Description and Existing Conditions

The Indian Avenue Historic District, previously known as the Indian Avenue Historic District, is located in the eastern portion of Middletown, between Green End Avenue on the north and Third Beach Road on the south. The district encompasses a one-quarter mile section of Indian Avenue and contains approximately a dozen noteworthy Late Victorian and early twentieth century structures. An 1884 stone chapel, St. Columba's Chapel, is located nearby (RIHPC, 1979a:13). Most of the houses are located to the east of Indian Avenue, overlooking the Atlantic Ocean, with many consisting of one-and-a-half to two-story houses set back from the road and obscured by trees. The original homes were typically constructed from stone or vertical board-and-batten walls. Additional outbuildings, such as carriage houses, were and continue to be a common feature of these large estates (RIHPC, 1979a:14-15).

The land gently rises from sea level at the river's shore to just over 50 feet at the district's northwestern corner. Just south of Vancluse Avenue, which forms part of the district's western edge, a small creek crosses Indian Avenue and meanders into the Sakonnet River east of the intersection of Vaucluse and Indian Avenues. The district's principal properties comprise a large, early twentieth century multiple resource estate with landscaped grounds, subdivided in the late twentieth century. It is comprised of four contributing buildings, five non-contributing buildings, and two discrete contributing sites. The contributing buildings include 75 Vancluse Avenue, 501 Indian Avenue, 502 Indian Avenue, 515 Indian Avenue, 521 Indian Avenue. The properties were largely divided from the Edward C. Knight, Jr. estate (Stonybrook) designed by Horace Trumbauer in 1928. In addition to the main house on a waterfront lot, the Knight estate extended across Indian Avenue, with formal gardens and outbuildings in the same style as Stonybrook (i.e., Late Gothic Revival) (Woodward, 2009).

3.8.2 Historic Context

From the time of European settlement in the eighteenth century until the mid-nineteenth century, the land within the Indian Avenue Historic District was primarily utilized for agriculture. A farmhouse stood at each end of the present-day district. In addition, a ferry landing near the end of Green End Avenue, originally known as Taggart's Ferry, carried farm produce between Little Compton and Newport until about 1870 (RIHPC, 1979a:13).

After the Civil War, the nearby town of Newport saw a marked increase in the purchase and construction of summer estates. Inspired by this growth, Eugene Sturtevant began his effort to make Middletown the "court end of the island" in 1871 (RIHPC, 1979a:6). Sturtevant and a partner purchased two and a half miles of farmland along the Sakonnet shore and money was invested into a 5-mile fenced road (Indian Avenue). The plat featured the road flanked by one hundred rectilinear lots, with an average frontage of 200 feet and depths of 400 feet or more (Woodward, 2009). The Indian Avenue neighborhood developed on a small scale, with the first purchases being made by Philadelphia and Hartford families. The advent of the automobile attracted more development within the district, as it was easier to drive the 3.5 miles from Newport (RIHPC, 1979a:13).

For the first three decades of the twentieth century, many new summer estates were constructed, though much of the original plat remained in agricultural use (Woodward, 2009). A pattern of summer estates with ample landscaped grounds interspersed with occasional farm fields defined the district in the decades after World War II. In the last quarter of the twentieth century another round of development added a new generation of large houses, filling in formerly undeveloped land or subdivided portions of the earlier estates (Woodward, 2009; RIHPC, 1979a:13).

3.8.3 NRHP Criteria and the Maritime Visual Setting

The Indian Avenue Historic District was added to the NRHP in 2009 under Criterion C. According to the NRHP Nomination Form (Woodward, 2009), the district is a "…notable example of the high-style residential development associated with the growth of an extensive summer-resort society that was centered in Newport, Rhode Island and spread into the neighboring towns of Middletown, Portsmouth, and Jamestown in the late nineteenth and early-twentieth centuries. The district… is the community's largest, most fully developed, and most intact representative of this phenomenon." In addition, it represents the work of a prominent architect of the time, Horace Trumbauer, and exemplified a style of life common to other sections of Middletown (RIHPC, 1979a:13). The district as a whole derives historic significance from its seaside location and maritime visual setting, as the location specifically relied on its coastal setting and maritime view in order to attract homeowners. According to the Rhode Island Historical Preservation & Heritage Commission (1979a:13), the maritime visual setting was an important aspect of the estates and District, as the "well sited lots afford[ed] good views of the river and ocean."

3.9 The Whetstone

3.9.1 Physical Description and Existing Conditions

The Whetstone is a two-story Early Victorian structure with two brick interior chimneys, round-head dormers, a front porch, and several additions. It is sited on the bluff overlooking Whetstone Point and Long Rock and Sachuest Bay at 455 Tuckerman Avenue (RIHPC, 1979a:34). The house is located approximately 100 meters from the shoreline and at approximately 40 feet above mean sea level, overlooking the Atlantic Ocean. The Whetstone is currently a privately owned home.

3.9.2 Historic Context

The Whetstone was built in 1860 by Lewis P. W. Balch, a doctor from New York, prior to the growth of Newport's summer colony after the Civil War (RIHPC, 1979a:6, 34). Prior to this, the Whetstone home was primarily located within a rural and agricultural environment. After the Civil War, increased construction in summer houses occurred on the south and east side of Tuckerman Avenue, as the lots offered views of the Atlantic Ocean. During the twentieth century, additional houses and roads were constructed to the north of the Whetstone. Currently, the Whetstone house is located within a moderately dense residential area.

3.9.3 NRHP Criteria and the Maritime Visual Setting

The Whetstone is an NRHP-eligible resource and appears to meet Criterion C. The house is a typical example of a mid-nineteenth century residence within Middletown, Rhode Island, embodying the distinctive characteristics of the type, period, or methods of construction. In addition, the house is in keeping with the vernacular building tradition of coastal New England. The property's natural landscape and maritime visual setting are a key component of its historic significance as a mid-nineteenth century vernacular seaside residence.

3.10 The Land Trust Cottages

3.10.1 Physical Description and Existing Conditions

The Land Trust Cottages are a group of five Shingle-style houses located off of Purgatory Road, at the east end of Easton Beach. The cottages are comprised primarily of two-and-a-half-story, gambrel-roof structures closely grouped together located between a tall hedgerow along Purgatory Road and Easton Bay.

3.10.2 Historic Context

The Land Trust Cottages were laid out for development in 1885-1887 under the guidance of Frederick Law Olmsted. The cottages were constructed as part of a wave of post-Civil War development in Middletown and Newport, primarily by businessmen and investors from Boston. In 1887-1888 E. B. Hall, a Boston builder, erected the cottages on a relatively small lot, positioned to take advantage of views of Easton Bay. The cottages have remained private residences since their construction, with relatively minimal alteration to materials or form (Nebiker and Kennedy, 1990; Jordy, 2012; Dunn, 2014).

3.10.3 NRHP Criteria and the Maritime Visual Setting

The Land Trust Cottages were included in the *Historic and Architectural Resources of Middletown RI* multi-property documentation form (Nebiker and Kennedy, 1990), but have not been formally listed on the NRHP. The RIHPHC have classified the property as potentially eligible for listing on the NRHP. The Land Trust Cottages appear to meet NRHP eligibility Criterion C as an intact, representative example of seaside Shingle-style residences, as well as for the associations with Frederick Law Olmsted. The coastal location and maritime visual setting of the cottages are a key component of their historic significance as late-nineteenth century summer cottages.

3.11 The Bluff/John Bancroft Estate

3.11.1 Physical Description and Existing Conditions

The Bluff/John Bancroft Estate is located at 575 Tuckerman Avenue. The property extends from the roadway to the bluffs overlooking Sachuest Bay. The building is an irregular-shaped, five-story Shingle-style residence originally constructed in 1895, converted into apartments in 1950, and renovated into ten luxury condominiums in 2006.

3.11.2 Historic Context

The Bluff/John Bancroft Estate was designed by architect William Ralph Emerson (regarded as one of the leading architects of the Shingle Style) for John Chandler Bancroft, a businessman and artist and collector of Japanese art from Boston, with a Japanese garden designed by Frederick Law Olmsted. The house was constructed on a bluff overlooking Sachuest Bay to take advantage of the sweeping views of the bay. The house was constructed as part of a wave of post-Civil War development in Middletown and Newport, primarily by businessmen and investors from Boston. Although Bancroft passed away in 1901, the building is still associated with his name due to his connections and contributions to the art world of Rhode Island in the late nineteenth century (RIHPC, 1979; Sieger, 2000; Historic New England, 2016; Dunn, 2017; WUC, 2020).

3.11.3 NRHP Criteria and the Maritime Visual Setting

The Bluff/John Bancroft Estate was included in the *Historic and Architectural Resources of Middletown RI* multi-property documentation form (Nebiker and Kennedy, 1990), but has not been formally listed on the NRHP. The RIHPHC have classified the property as potentially eligible for listing on the NRHP. The Bluff/John Bancroft Estate appears to meet NRHP eligibility National Register Criterion A for its associations with John Chandler Bancroft, and Criterion C as an intact, representative example of the work of William Ralph Emerson, a prominent New England architect renowned for his Shingle-style designs, as well as the associations with Frederick Law Olmsted, who designed the Japanese garden on the property that is partially intact. The property’s coastal location and uninterrupted maritime visual setting are a key component of its historic significance as a mid-nineteenth century seaside estate.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Development of a Coastal/Shoreline Resiliency and Climate Adaptation Plan for Historic Properties

4.1.1 Purpose and Intended Outcome

The *2019 Strategy for Reducing Risks from Hazards in Middletown, Rhode Island*, states that properties are at "significant erosion risk due to coastal surge" and properties located in floodplains were identified as a top concern for the Town (Town of Middletown, 2019). In addition, the 2015 *Comprehensive Community Plan* states that the protection and enhancement of historic properties, including the eight historic properties included in this HPTP, is identified as important to the town and its economy (Town of Middletown, 2015).

This purpose of this mitigation measure is to develop a Coastal/Shoreline Resiliency and Climate Adaptation Plan for the Town of Middletown to address these concerns. Public engagement will allow the Town to make optimal decisions about property management and preservation. The plan will provide the Town and historic property owners with specific measures that can be taken to protect their historic properties from flooding, coastal erosion, and other climate related threats. The plan may also include an update of the historic properties inventory per the goals of the 2015 *Comprehensive Community Plan*.

4.1.2 Scope of Work

This scope of work will consist of the following:

- Review existing Town planning and hazard mitigation documents, guidance, and regulations;
- Review existing historic properties inventory;
- Photograph and document existing conditions;
- Solicit public engagement to discuss town-wide historic preservation priorities;
- Develop an updated historic property inventory, if required;
- Distribute the updated historic property inventory to the Participating Parties, if warranted;
- Draft a historic property-specific Coastal/Shoreline Resiliency and Climate Adaptation Plan;
- Distribute the draft plan to the Participating Parties for review and comment;
- Develop the final plan to be distributed the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The preferred consultants will have experience in developing Coastal/Shoreline Resiliency and Climate Adaptation Plans for historic properties. The consultants will engage the public and Participating Parties to develop a list of prioritized action items to protect and preserve historic properties. The draft and final plans will be developed in consultation with the Participating Parties.

4.1.4 Standards

The mitigation measure will comply with following standards:

- Town of Middletown Planning Regulations;
- Current Climate Adaptation, Resiliency, and related guidance;
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68;
- The Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4); and
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP; and
- Photographs and documentation of existing conditions.
- Draft updated historic property inventory, if required
- Final updated historic property inventory, if required
- Draft Coastal/Shoreline Resiliency and Climate Adaptation Plan; and
- Final Coastal/Shoreline Resiliency and Climate Adaptation Plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Historic Context for Summer Cottage/Resort Development

4.2.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Fairhaven. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;
- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.2.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with the Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm –Rhode Island Historic Properties, February 3, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 22 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: PUCATEST NECK HISTORIC DISTRICT, TOWN OF TIVERTON, NEWPORT COUNTY, WASHINGTON COUNTY, RHODE ISLAND

[Insert ATTACHMENT 22 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review and Comment by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Puncatest Neck Historic District

Town of Tiverton, Newport County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Puncatest Neck Historic District
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
APE	Area of Potential Effects
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for Puncatest Neck Historic District, a Rhode Island Historical Preservation & Heritage Commission (RIHPHC) Historic Resource, (the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
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- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
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- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable National Register of Historic Places (NRHP) criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

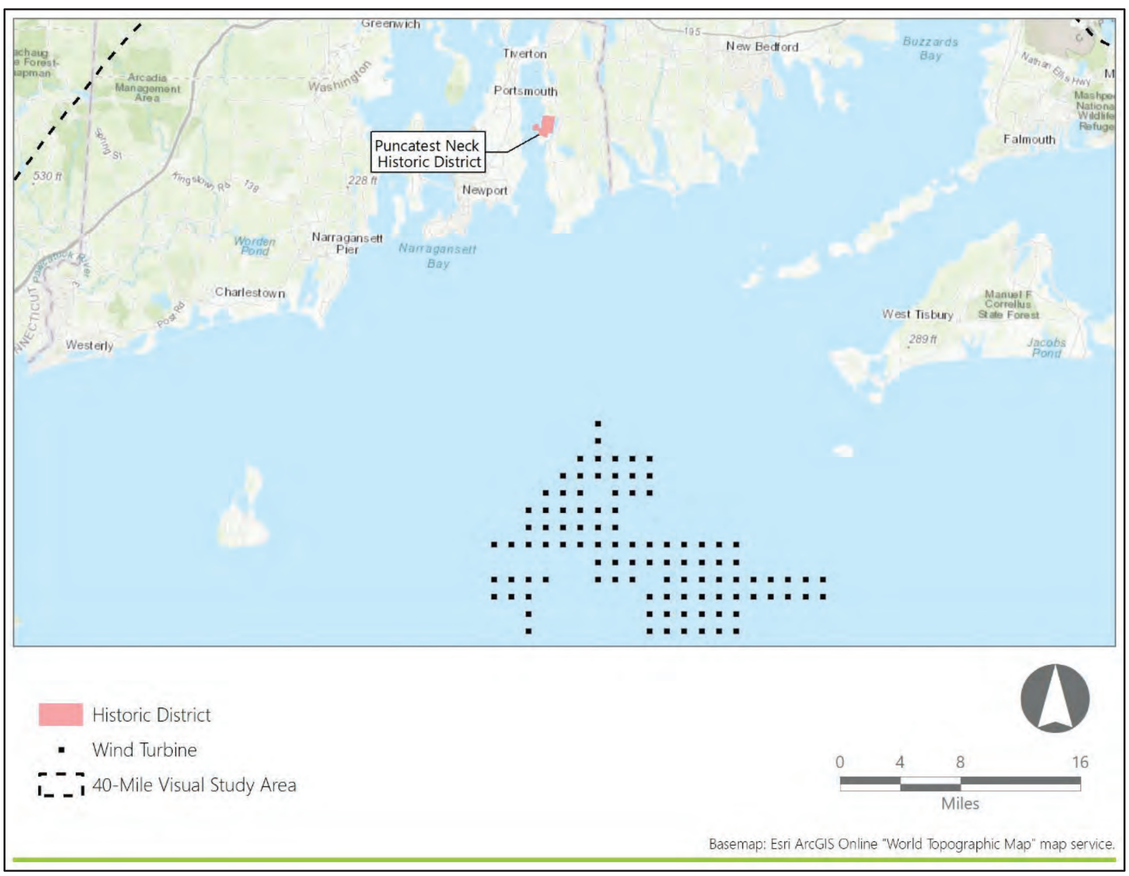
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (Federal Register, 2021). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of Tiverton
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

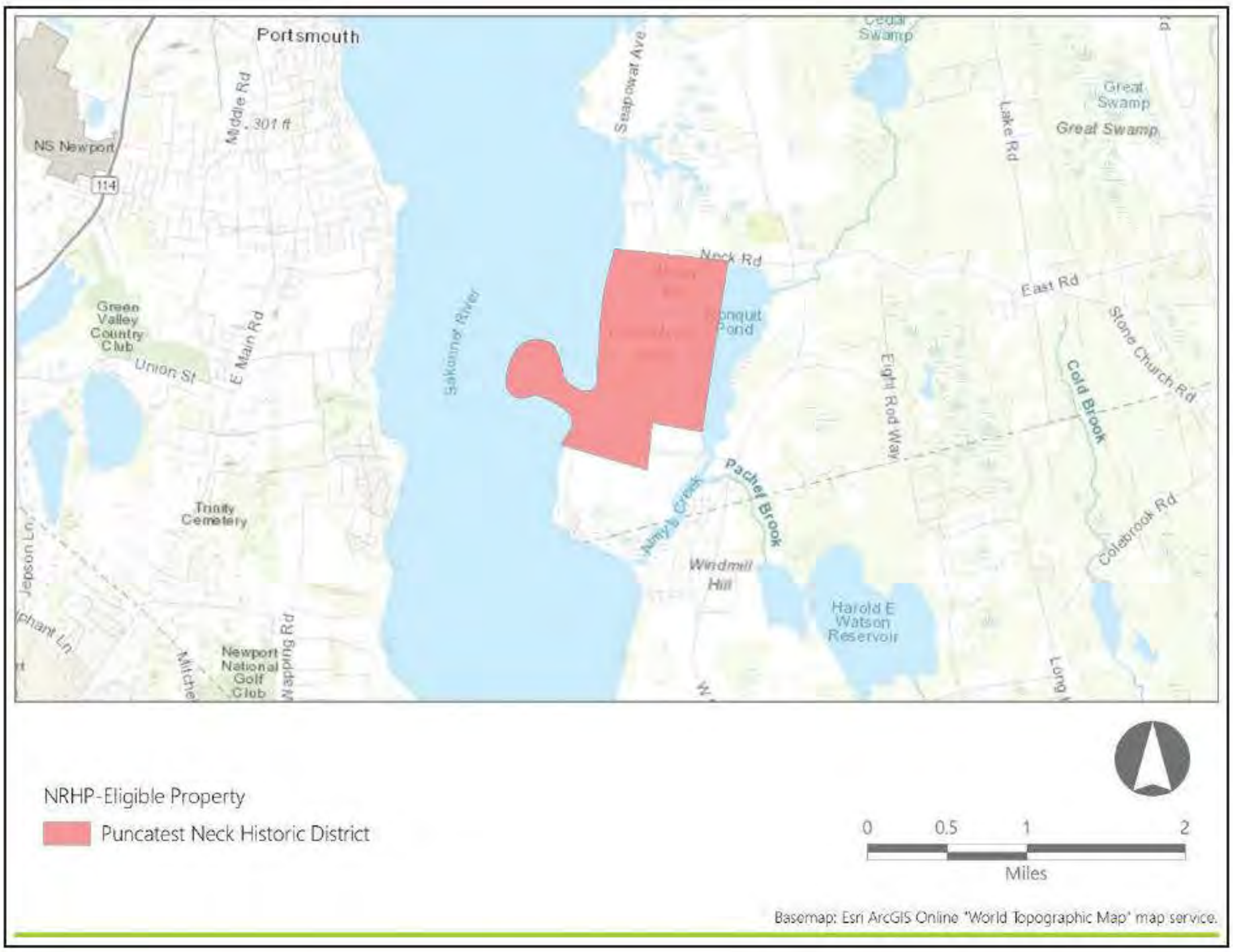
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Property included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Puncatest Neck Historic District	RIHPHC Historic Resource	Tiverton	RI	234	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The Puncatest Neck Historic District is considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the Estates and Estate Complexes property type. These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

Historic seaside villages, ports and other districts in the study area are commonly characterized by dense development and narrow roadways. The maritime setting for such districts is often obvious and may be expressed through the design and orientation of homes, commercial properties and other buildings, parks, docks, piers, and breakwaters. Depending on the specific characteristics of each district, open ocean views may or may not be available from the majority of historic buildings and other areas within a village. Further, marine viewsheds may encompass limited areas due to the complexity of the shoreline and presence of points, necks, or islands that screen views towards the open ocean. Where ocean versus bay views are available but are tangential to the dominant aspects of maritime viewsheds, changes to those distant ocean views may not diminish the integrity of a seaside village or other historic district. Where ocean views are a dominant aspect of the maritime setting, changes to such viewsheds may diminish the integrity of a historic district, even where views are limited to immediate shoreline sections.

Maritime settings for historic piers, marinas, and related marine infrastructure are likely to include strong associations with specific harbors, coves, and bays where related activities were focused, and which exerted a significant influence on the design and construction of the historic infrastructure. The relationship of such local settings to ocean waters and the extent to which open ocean views represent an important element of a specific historic property's setting will vary depending on the orientation of the shoreline and the location of the historic property. The size and location of historic buildings and structures relative to each other and other elements of the surrounding environment may also be important to the overall integrity of historic maritime infrastructure.

3.3 Puncatest Neck Historic District

3.3.1 Physical Description and Existing Conditions

Puncatest Neck is located in the southwestern portion of Tiverton between Nonquit Pond and the Sakonnet River. The 1979 RIHPHC report entitled *Historic and Architectural Resources of Tiverton, Rhode Island: A Preliminary Report,* identified 18 resources within the potential historic district as well as a ferry landing site, three former wharves, and the King Philip's War Battle Site (RIHPHC, 1979). Of the 18 historic homes identified, it appears 17 are extant. The district runs along Puncatest Neck Road with the northern boundary approximately where Puncatest Neck Road takes a sharp, ninety-degree turn, to the southern end of the road, and along Fogland Road and includes Fogland Point.

While many of the properties have additions, seventeen of the residences appear to retain the integrity and significance to be eligible for listing on the NRHP. One of which, the Cook-Bateman Farm, is individually listed on the NRHP and one, the William Almy Farm/Fogland Farm/Puncatessett at 435 Puncatest Neck Road has been demolished. The former sites of the wharves, ferry land and the King Philip's War Battle Site would also be contributing resources to this historic district. The contributing resources are as follows:

- Cook Almy House – 58 Fogland Road
- Almy House – 103 Fogland Road
- John Almy House – 148 Fogland Road
- Former Site of Almy's Ferry Landing – Fogland Point
- Former Site of Almy's Wharf – Fogland Road
- Captain Gideon Wilcos House – 425 Puncatest Neck Road
- A. Wilcoc House – 481 Puncatest Neck Road
- Captain Fernando Wilcox House – 488 Puncatest Neck Road
- Peleg Cory House – 531 Puncatest Neck Road
- J. Piece House – 532 Puncatest Neck Road
- Captain George Gray House – 560 Puncatest Neck Road
- Isaac G. White House – 563 Puncatest Neck Road
- Robert Gray House – 630 Puncatest Neck Road
- Stephen Grinnell House – 677 Puncatest Neck Road
- Otis Almy House/Heathersfield – 737 Puncatest Neck Road
- Horace Almy House/Nanquit Farm – 807 Puncatest Neck Road

- Samuel E. Almy House – 494 Puncatest Neck Road
- Cook-Bateman Farm – 958 Puncatest Neck Road
- Ferol Bink Farm – 993 Puncatest Neck Road
- King Philip's Battle Site– Fogland Road
- Cory's Wharf/White's Wharf – Fogland Point
- Pierce's Wharf – Fogland Point

3.3.2 Historic Context

In 1659, Puncatest Neck was granted to 75 freeman of Plymouth Colony and 36 lots were defined, although no "substantial structures" were built. On July 8, 1675, one of the battles of King Philip's War was fought on Puncatest Neck. The first known structures were constructed around 1680 by the Church and Almy families. During the seventeenth and eighteenth centuries, Puncatest Neck was primarily agricultural. In the early eighteenth century a ferry was established on Fogland Point connecting Tiverton to Dartmouth and Newport and in the early nineteenth century the first wharf was established, shifting the economy of Puncatest Neck toward maritime related industries including fishing, oystering, and whaling. The wharf was expanded circa 1863 and in 1870 a second wharf was constructed. As industry increased, new residences were constructed, both modest and more opulent and in the late nineteenth century and through the twentieth century, additional residences were constructed to be used as summer residences (RIHPHC, 1979).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Puncatest Neck Historic District is eligible for listing under Criterion A for its association with the history of Tiverton, including farming, maritime, and summer colony development as well as the architecture of the contributing resources.

Similar to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Tiverton particularly on Puncatest Neck and Nannaquaket Neck (RIHPHC, 1979). These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. As stated above, Puncatest Neck is located between Nonquit Pond to the east and Sakonnet River to the east and Nannaquaket Pond is located on the eastern side of Nannaquaket Neck and the Sakonnet River is located to the west.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Context for Summer Cottage/Resort Development

4.1.1 Purpose and Intended Outcome

Similar to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Tiverton particularly on Puncatest Neck and Nannaquaket Neck (RIHPHC, 1979). These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;

- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.1.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. The proposed mitigation measures were developed by Revolution Wind. As part of the development of this HPTP, Revolution Wind anticipates conducting targeted outreach with the Participating Parties identified in Section 2.3.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

Code of Federal Regulations (CFR). 2021a. 36 CFR 800 – Protection of Historic Properties [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-VIII/part-800. Accessed December 21, 2021.

CFR. 2021b. 36 CFR 61.4©(1) – Procedures for State, Tribal, and Local Government Historic Preservation Programs [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-61#p-61.4(e)(1). Accessed December 21, 2021.

CFR. 2021c. 36 CFR 65.2(c)(2) – National Historic Landmarks Program – Effects of Designation [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-I/part-65#p-65.2(c)(2). Accessed December 21, 2021.

CFR. 2022. 40 CFR 1500 – National Environmental Policy Act Implementing Regulations. Available at https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A. Accessed January 7, 2022.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR). 2022. *Historic Resources Visual Effects Analysis, Revolution Wind Farm.* Syracuse, NY. July 2022.

Federal Register. 1997. 62 FR 33708 – The Secretary of the Interior's Historic Preservation Professional Qualifications Standards. Office of the Federal Register, National Archives and Records Administration. Washington, D.C. Available at https://www.govinfo.gov/app/details/FR-1997-06-20/97-16168. Accessed December 21, 2021.

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Revolution Wind, LLC. 2021. *Construction and Operations Plan for the Revolution Wind Farm and Revolution Wind Export Cable Project.* Available at https://www.boem.gov/renewable-energy/state-activities/revolution-wind-farm-construction-and-operations-plan-april-2021. Accessed January 12, 2022.

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Town of Tiverton, 2022. GIS and Property Cards. Town of Tiverton Tax Assessor. Available at https://www.tiverton.ri.gov/departments/taxassessor/gismaps.php. Accessed June 2022.

ATTACHMENT 23 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: EIGHT HISTORIC PROPERTIES, TOWN OF NARRAGANSETT, WASHINGTON COUNTY, RHODE ISLAND

[Insert ATTACHMENT 23 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Eight Historic Properties

Town of Narragansett, Washington County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Dunmere The Ocean Road Historic District The Towers Historic District The Towers The Life Saving Station at Narragansett Pier Fort Varnum/Camp Varnum Narragansett Pier MRA The Dunes Club
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MOA	Memorandum of Agreement
NEPA	National Environmental Policy
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
OCS	Outer Continental Shelf
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation and Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Towers Historic District, which is listed on the National Register of Historic Places (NRHP); the Towers, which is listed on the NRHP; the Life Saving Station at Narragansett Pier, which is listed on the NRHP; Dunmere, which is listed on the NRHP; the Ocean Road Historic District, which is listed on the NRHP; Fort Varnum/Camp Varnum, which has been determined to be eligible for listing on the NRHP by the Rhode Island Historical Preservation & Heritage Commission (RIHPHC); Narragansett Pier MRA, which is listed on the NRHP; and the Dunes Club, which is listed on the NRHP (hereinafter, the Historic Properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

[1] The timeline is subject to change and is based on current available information.

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder

engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

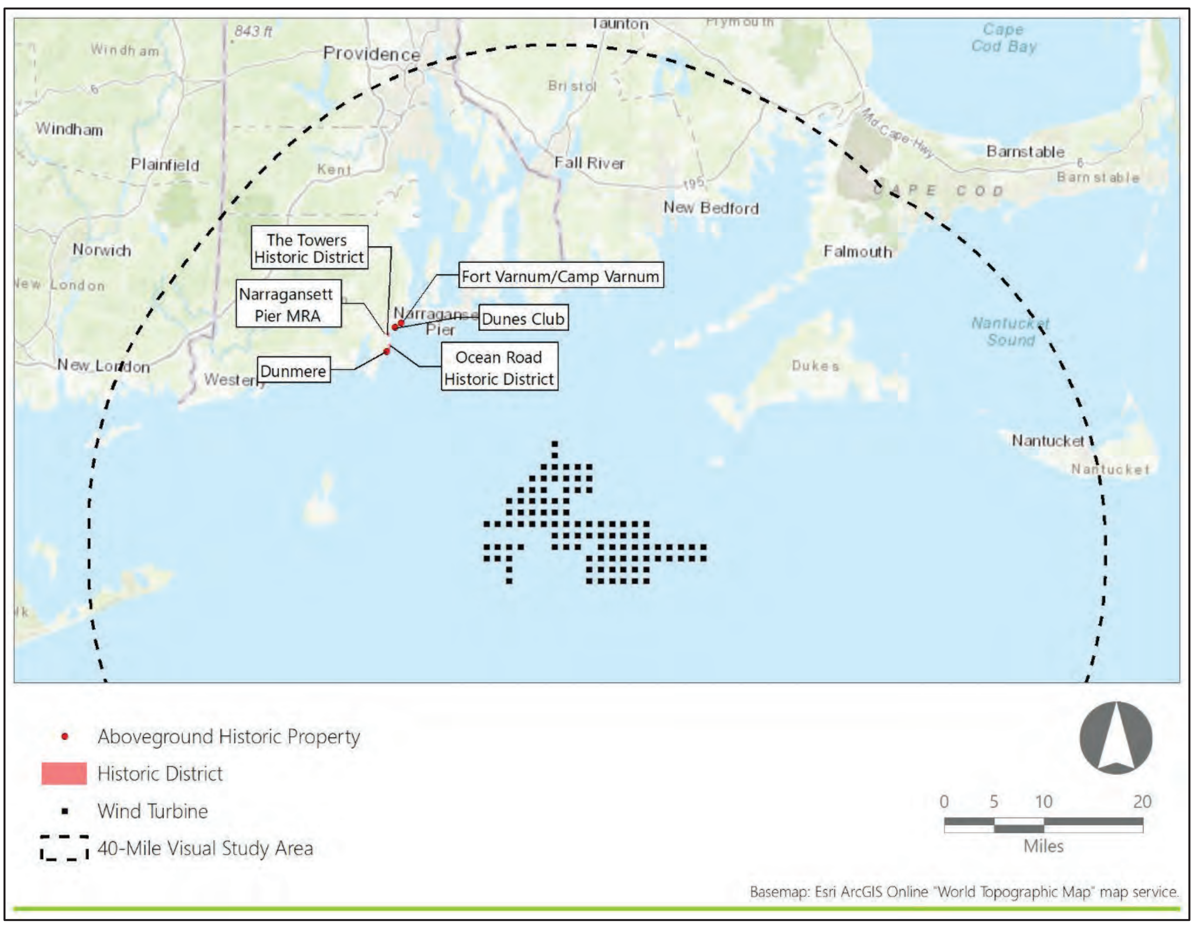
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location Map



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. Any mitigation work associated with the historic properties will comply with the conditions of all extant historic preservation easements. The RIHPHC holds a Historic Preservation Easement on the Towers, which is a contributing resource to the Towers Historic District. Additional information regarding compliance with extant preservation restrictions appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- The Town of Narragansett
- The Narragansett Historic District Commission
- The Narragansett Historical Society
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

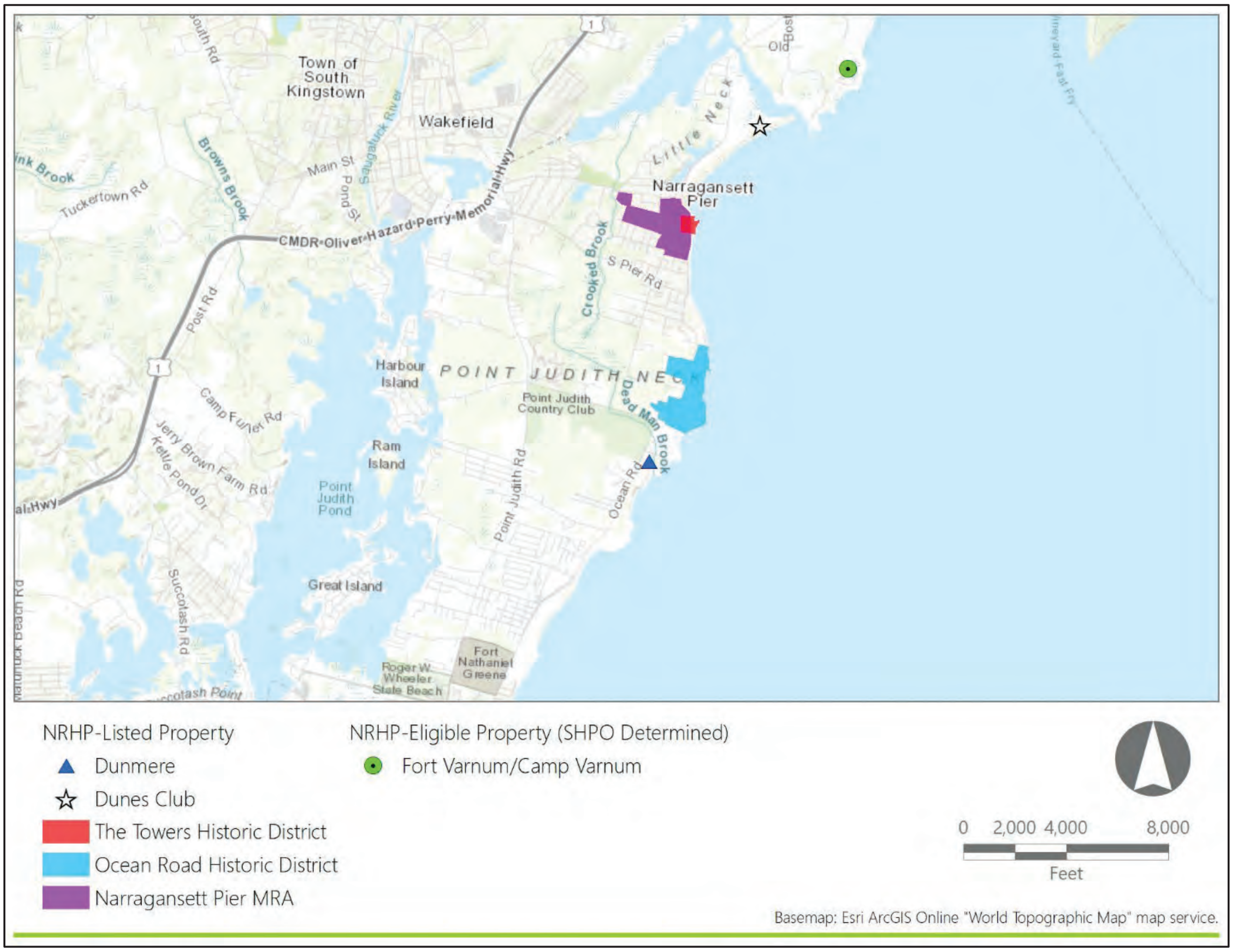
3.1 Historic Properties

This HPTP involves seven historic properties, as identified in Table 3.1-1 and located on Figures 3.1-1 and 3.1-2.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Dunmere	NRHP-Listed	Narragansett	RI	05001061 (NRHP)	Private	Estates and Estate Complexes
Ocean Road Historic District	NRHP-Listed			82000019 (NRHP)	Private	Recreational Properties
Towers Historic District	NRHP-Listed			82000021 (NRHP)	Private; Public	Recreational Properties
The Towers	NRHP-Listed			69000001	Private	Recreational Properties
Life Saving Station at Narragansett Pier	NRHP-Listed			76000010 (NRHP)	Private	Maritime Safety and Defense Facilities
Fort Varnum/Camp Varnum	RIHPHC Historic Resource			N/A	Federal	Maritime Safety and Defense Facilities
Narragansett Pier MRA	NRHP-Listed			64000753 (NRHP)	Private	Recreational Properties
Dunes Club	NRHP-Listed			15000243 (NRHP)	Private	Recreational Properties

Figure 3.1-1. Historic Property Location Map



In Sections 3.3. through 3.9, each resource is individually considered, described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA: "Maritime Safety and Defense Facilities," "Lighthouses and Navigational Aids," "Recreational Properties," and "Estates and Estate Complexes." Each property type is defined below as well as the characteristics typical of their maritime setting.

"Maritime Safety and Defense Facilities" consists entirely of facilities erected by bureaus of the U.S. Department of Defense or their predecessors and share historic associations with coastal defense. These structures vary in their design and construction materials but are unified by their historic functions of rescuing and protecting maritime transportation in the area, or for coastal defense.

Historic military and maritime safety properties along the shoreline will likely be associated with maritime settings. Aesthetic considerations in the siting of such facilities may or may not be expressed in the design of buildings, structures, and landscapes depending on the age and specific functions of the property. Proximity to navigation channels, defensibility, and the presence of existing shipbuilding or repair infrastructure in a broader maritime context may have been significant considerations in the siting of naval facilities. Such factors may not demonstrate a significant association with open ocean viewsheds. The study area includes several significant examples of World War II-era defense structures, including fire control or observation towers designed to monitor specific parts of the maritime environment. Early lifesaving stations were likewise intended to provide for observation of marine waters in the vicinity of know hazards or where storms posed specific risks to sea-going or coastal vessels. Lifesaving stations were also frequent located where rescue boats or other vessels might be safely launched under treacherous conditions. These locations may have included inlets, harbors or coves adjacent to open waters where rescue and recovery efforts would likely be made.

"Lighthouses and Navigational Aids" is defined by the historic associations with water-related transportation and defense, prominent views of the sea and dominance of the surrounding landscape, and common architectural forms. These structures present themselves as prominent and iconic features on the coastal landscape, possess elevated views of the ocean horizon, and are sited specifically for those elevated views.

Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid.

"Recreational Properties" is defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish. These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities.

The same macroeconomic trends that saw the decline of the quintessential New England farm in the mid-19th century are associated with a population shift to cities and rise in affluence for some segments of society. Summer resorts, supported by steamships, rail transportation, and eventually, automobiles were developed in numerous locations in the study area in the late 19th century. These resorts varied between properties intended to serve the rising group of "upper middle income" families living in the region's cities to estate-like developments serving a more affluent set. Seaside resorts, like many other shoreline recreational, commercial, and residential properties, were often sited to take advantage of aesthetically pleasing ocean or maritime views. Depending on location and the the conformation of the local shoreline, such properties may be associated with specific bay or cove viewsheds that include limited areas of the open ocean waters. Recreational activities at resorts frequently included swimming and designated beaches where residents and visitors may have spent considerable time during the summer months. Where these features are still present and express a tangible association with the historic resort property, views from beaches may be as important as views from more formal elements of the designed landscape. Likewise, historic hotels and inns became more common elements of the region's shoreline communities in the late 19th century. Such properties were often sited near harbors, ferry landings, rail stations, and public or private beaches and may be associated with similar historic maritime settings. Views to ocean waters or the more intimate bays and coves of the region may have been an integral part of the visitor's motivation for staying in such establishments. Such considerations can be expressed through the inclusion of building and landscape features clearly intended to afford views of ocean. Older taverns and inns in the study area may be found along the working harbors and ports and were intended to serve the fishing, whaling, and related participants in maritime commerce. The design and location of these properties may not show the same influence of aesthetic considerations but will likely also retain a strong association with the waterfront and maritime environment.

"Estates and Estate Complexes" consists of high-style residences, or groupings of residences, typically designed by prominent architects of the nineteenth and early twentieth centuries, such as Richard Morris Hunt and McKim, Mead and White. This property type consists mainly of the mansions and summer “cottages” built by wealthy industrialist families, drawn to the vicinity of Newport, Rhode Island as it became a prominent vacation and recreation area for the emerging American elite, and to Montauk Point as a naturalistic and remote enclave.

Estates built by or for wealthy families have been part of the region’s landscapes for centuries and many such properties are located along the shorelines. High style, architect-designed mansions and associated landscapes are characteristic of several areas within the study area and many such properties were sited to take advantage of ocean views. The importance of maritime settings to these properties may be apparent in the design of building features such as veranda, porches, and large windows facing the water or through landscape elements and overall designs that were intended to frame specific views towards the seas. As with many other historic property types, the conformation of local shorelines and the specific orientation of each property may be important in assessing the association with specific aspects or elements of each associated viewshed.

3.3 Dunmere

3.3.1 Physical Description and Existing Conditions

Dunmere, also known as Dunmere Gardener’s Cottage, Gate, and Garden, is a 3.4-acre estate located at 560 Ocean Road in Narragansett, Rhode Island, approximately 600 feet from the coastline of Narragansett Bay. The property consists of the original Gardener’s Cottage, entrance gate, and associated garden landscape. The Gardener’s Cottage is a two-story building featuring granite masonry and wood construction. A three-story conical tower on the south elevation rises above the multi-gabled roof and a massive granite chimney rises from a central point in the roof. Fenestration is varied, with examples of Queen Anne and Eastlake-style windows, including single, fixed-pane and one-over-one, double-hung sash windows, some with colored geometric lights and delicate wood mullions and muntins (Youngken et al., 2005).

The entrance gate is of rough-cut granite construction and features an elliptical arch which appears to emerge from the natural rocky outcrops at the north side of the arch. A two-story conical tower on the south side of the arch features a small rectangular open window. A small, hipped roof projects from the base of the turret over a stone patio. The word “Dunmere” is legible within the design on a pair of decorative wrought-iron gates. Although much of the historic landscape has been removed or destroyed over time, the extant landscape architecture associated with the historic Dunmere estate include some garden terraces, fountains, a man-made pond, stone-arched bridge and stone retaining walls (Youngken et al., 2005).

3.3.2 Historic Context

The Dunmere estate was designed by John M. Merrick and constructed in 1883 for investor and financial pioneer Robert G. Dun. Dun began developing his estate after the expansion of Ocean Road and the growth of Narragansett as a recreational resort. Spanning over ten years, the construction at Dunmere included a three-and-one-half-story Queen Anne-style mansion on a rocky outcropping near the sea, a water tower, and a windmill. The landscape design was developed under the direction of the landscape architect Nathan Franklin Barrett, and eventually expended to encompass over 13 acres. The water tower was expanded and renovated to become the present Gardener's Cottage. Several of the estate buildings, including the main house, have been lost over the years to fire and demolition, and the original estate boundaries have been subdivided (Youngken et al., 2005).

3.3.3 NRHP Criteria and the Maritime Visual Setting

Dunmere is listed on the NRHP and meets NRHP Criteria A and C for its associations with seasonal maritime recreation in late nineteenth-century New England and for its importance as an example of a seasonal estate complex with Gilded Age landscape design (Youngken et al., 2005). The location of the original mansion near the ocean speaks to the property's historic association with views to and enjoyment of the seascape. The historic properties have views of the open ocean to the east. The remaining buildings are significant due to their importance as elements of a late-nineteenth century seaside estate complex. Dunmere was listed in the NRHP in 2005.

3.4 The Ocean Road Historic District

3.4.1 Physical Description and Existing Conditions

The Ocean Road Historic District is an approximately 92-acre historic district located in Narragansett, Rhode Island, and includes 45 residences situated on portions of Ocean and Wildfield Farm Roads and Hazard and Newton Avenues. This district consists of various examples of Shingle-style houses and estates situated along the coastline that exhibit a range of expressions of the style. Among the most striking examples of architecture within the district is the unique two-and-one-half-story stone Hazard Castle with a 105-foot-tall tower, the Suwanee Villa Carriage House designed by James H. Taft with its conical tower, and the Colonial Revival-style Rose Lea designed by Willard Kent (Roise, 1981).

3.4.2 Historic Context

The history of the Ocean Road Historic District began with the acquisition of the land now encompassing the district boundaries by Joseph P. Hazard. Hazard's initial construction efforts included the Hazard Castle, which took nearly 40 years to complete, but which influenced the style and setting of the surrounding area. Based on Hazard's interpretation of English castles and informed by his spiritualist beliefs, Hazard Castle became the touchstone from which the eclectic slant of the Shingle style was expressed through subsequent development of the seaside resort town. In addition, Hazard began planting trees along the bluffs, ancestors of the trees that make up the wooded area in and around the district today. In addition, many of the residences were designed by prominent architects of the late nineteenth century, such as McKim, Mead, and White, and William Gibbons (Roise, 1981). The district was listed in the NRHP in 1982.

3.4.3 NRHP Criteria and the Maritime Visual Setting

The NRHP-listed Ocean Road Historic District meets Criterion C for high-style seasonal residences of the wealthy and famous of the Gilded Age. Most of the contributing properties "stand on dramatic sites overlooking the rocky shoreline and are oriented to the ocean" (NPS, 1982). The district also meets NRHP Criterion A for its association with the maritime resort community that developed around Narragansett Pier.

Situated along the coastline, its relationship to the water is central to the significance of the district. Many of the contributing properties within the district enjoy expansive views of the Atlantic Ocean and were sited to take advantage of those vistas.

3.5 The Towers Historic District

3.5.1 Physical Description and Existing Conditions

The Towers Historic District is an approximately 10-acre district bounded by Exchange Place, Mathewson Street, Taylor Street, and the Atlantic Ocean in the unincorporated village of Narragansett Pier. The district is comprised of 13 contributing resources including the Towers, the Life Saving Station at Narragansett Pier, a town park, and 10 private residences. Additionally, there is one non-contributing resource within the district, a residence built circa 2006 (Town of Narragansett, 2022).

The Towers and the Life Saving Station at Narragansett Pier are described in Sections 3.3.1 and 3.4.1, respectively. Both are substantial Romanesque Revival-style stone buildings. The Towers span Ocean Road, while the Life Saving Station is sited between Ocean Road and the Atlantic Ocean. North and west of the Towers, Memorial Park occupies approximately 1.6 acres. It consists primarily of open lawn, with a memorial fountain set within a paved plaza at the northeast corner and a group of war memorial monuments at the northwest corner (Roise, 1981).

The remaining contributing resources within the district are residences constructed between circa 1822 and 1900 in popular nineteenth-century styles including the Federal, Italianate, Second Empire, Colonial Revival, and Shingle styles. All of the residences feature wood clapboard or shingle siding and retain a generally high degree of integrity. Three of the residences are sited on Ocean Road facing east to the Atlantic Ocean (Roise, 1981).

3.5.2 Historic Context

The Town of Narragansett is named for the Narragansett Indian Tribe, the indigenous people of Rhode Island. The town was primarily agricultural in character from the late seventeenth century through the mid-nineteenth century (RIHPHC, 1991). Piers and wharves constructed along the shore during this time contributed to a diversified economy based on fishing, shipbuilding, and the export of agricultural products. A pier built in the late eighteenth century near the present site of the Towers gave the village of Narragansett Pier its name. One of the contributing resources within the Towers Historic District, the residence at 16 Mathewson Street, was built during this period, circa 1822 (Roise, 1981).

The transformation of Narragansett Pier from a working port village to a tourist destination began in the 1840s, when the first visitors began to spend the summer season as boarders in private homes. The village's first hotel was built in 1856 and by 1871 ten additional hotels were built to serve guests from throughout the Northeast, Mid-Atlantic, and Midwest. The construction of private summer residences and rental cottages soon followed, and Narragansett Pier became a fashionable resort town popular with businesspeople, industrialists, and members of the professional class. The residences within the Towers

Historic District were primarily built during this period, as either private residences or rental properties. The Narragansett Casino and the Life Saving Station at Narragansett Pier were both designed by McKim, Mead and White, and constructed in the 1880s (Roise, 1981; RIHPHC, 1991).

In 1900 a catastrophic fire destroyed most of the Narragansett Casino, along with the Rockingham Hotel and neighboring commercial buildings. Several of the large nineteenth-century hotels also burned in the early decades of the twentieth century. During this period, Narragansett Pier's tourism economy began to shift away from long-term renters towards day-trippers and short-term guests. Other physical changes included damage or destruction of many buildings in the area by hurricanes in 1938, 1954, and 1991. In the post-World War II era, the year-round population of the village and town increased, further altering the Pier's character as a seasonal resort community. Urban renewal activity in the 1970s resulted in the clearance of nineteenth-century buildings from a 28-acre area northwest of the Towers Historic District. The site of the former Narragansett Hotel was purchased by the Town of Narragansett in 1931 and developed as Memorial Park (Roise, 1981; RIHPHC, 1991). The Towers Historic District was listed in the NRHP in 1982.

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Towers Historic District meets National Register Criteria A and C for its relationship to the development of seaside tourism in Narragansett Pier and as a collection of intact nineteenth-century buildings which directly relate to tourism and maritime activity. The district's period of significance is 1850 to 1924 (Roise, 1981). The district as a whole derives historic significance from its seaside location and maritime visual setting. The siting of the Towers and several of the district's residences, in particular, provide expansive views of the ocean, while the Life Saving Station at Narragansett Pier was sited especially close to the ocean in order to facilitate the launch of lifeboats.

3.6 The Towers

3.6.1 Physical Description and Existing Conditions

The Towers is a multistory stone building with a roughly I-shaped plan formed by two pairs of engaged round towers connected by a massive east-west segmental arch spanning Ocean Road. The building has a steeply pitched main gable roof with multiple dormers while the towers have conical dormered roofs. A wing to the west has dormered hipped roofs. The exterior is of rock faced granite and the roofs are clad in wood shingles. Windows are primarily six-over-one or nine-over-one double hung sash. Primary entrances to the east and west tower sections are located within arched openings below the main arched volume. A small octagonal cupola and lantern are located at the center of the main gable roof. The Towers currently serves as a public event venue and is owned by the Town of Narragansett (Roise 1981; RIHPHC, 1991).

3.6.2 Historic Context

The village of Narragansett Pier was a leading seaside resort town during the last quarter of the nineteenth century. Several grand hotels and numerous private residences and rental cottages were constructed during this period. The Narragansett Casino was built between 1883 and 1886, serving as the center of social activity during the summer season. The rambling casino was designed by McKim, Mead & White, the nationally prominent firm that had designed the Newport Casino just a few years earlier. The stone Towers served as a grand entrance linking the casino to the shore over Ocean Road, while the bulk of the building, consisting of guest rooms, card rooms, and dining rooms, was built of wood. A massive fire on September 12, 1900, destroyed the wood portions of the casino, including the roofs of the Towers, leaving only the stone portions of the Towers standing. The roofs of the Towers were subsequently rebuilt, and the building was acquired by the Town of Narragansett and renovated for use as a town hall. The Towers was individually listed in the NRHP in 1969 and was included as a contributing resource to the Towers Historic District, listed in the NRHP in 1982. Today, the building is utilized as an event venue (Roise, 1981; RIHPHC, 1991). A major exterior and interior restoration was completed in 2017.

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Towers is an iconic building in the village of Narragansett Pier and is the sole remnant of the community’s many Gilded Age hotels. The building meets National Register Criteria A and C for its relationship to the development of seaside tourism in Narragansett Pier, as a notable example of seaside recreational architecture in the Romanesque Revival style, and as the work of McKim, Mead & White. The Narragansett Casino’s oceanfront location and orientation provide expansive ocean vistas. This maritime visual setting is a key component of the Towers’ historic significance.

3.7 The Life Saving Station at Narragansett Pier

3.7.1 Physical Description and Existing Conditions

The Life Saving Station at Narragansett Pier, also known as the Coast Guard House, is a two-story stone building located about 50 feet from the Atlantic Ocean on the east side of Ocean Road. The north end of the building is semicircular in plan while the south end is rectangular. The exterior is of rock faced granite ashlar and the gable-conical roof is clad in asphalt shingle. Multiple additions to the north, east, and south, dating from the late twentieth and early-twenty-first centuries, are primarily constructed of wood. The west elevation of the main volume features Roman arch openings which continue along the apsidal north end of the building. A bas-relief sculpture of a ship anchor decorates the parapeted gable end of the south elevation. Three rectangular window openings on this elevation are now obscured by later additions (Jones, 1976).

3.7.2 Historic Context

The United States Life-Saving Service was founded in 1848 as a volunteer organization providing rescue services along the New England and Mid-Atlantic coast. Early lifesaving stations consisted of utilitarian structures housing lifeboats and other equipment, often located near dangerous shoals and rocks. The service was nationalized by Congress in 1871, and funding provided for full-time crews to staff lifesaving stations. Congress authorized the construction of two initial stations in Rhode Island in the early 1870s, one on Block Island and the other at Narragansett Pier. This first lifesaving station at Narragansett Pier was a wood structure completed by 1873 north of the public beach (Jones, 1976).

The current Life Saving Station was built in 1888. It was designed by the nationally prominent architecture firm of McKim, Mead & White, which had completed the neighboring Narragansett Casino two years prior. The form and materials of the Life Saving Station complemented those of the casino. The Life Saving Station's ground floor served as a boathouse and had a sloping floor which allowed lifeboats to be launched through the arched openings, while the second floor served as the living quarters for the life station crew (Jones, 1976).

The Life-Saving Service was merged with the Revenue Cutter Service in 1915 to become the United States Coast Guard, which began consolidating lifesaving stations in the 1920s. The Life Saving Station at Narragansett Pier, then known as the Coast Guard House, was closed in 1946. It was subsequently converted into a dining establishment and continues in that function today, having survived damage from Hurricane Carol in 1954 and Hurricane Bob in 1991, as well as a fire shortly before it was listed in the NRHP in 1976. It was included as a contributing resource to the Towers Historic District, listed in the NRHP in 1982 (Jones, 1976; Roise, 1981).

3.7.3 NRHP Criteria and the Maritime Visual Setting

The Life Saving Station at Narragansett Pier meets National Register Criteria A and C for its association with the U.S. Life Saving Service and the early development of the U.S. Coast Guard, as a rare surviving example of a nineteenth-century lifesaving station, and as the work of McKim, Mead & White. The building's use as a boat launch necessitated its siting very close to the water on the ocean side of Ocean Road. This maritime visual setting is a key component of the Life Saving Station's historic significance.

3.8 Fort Varnum/Camp Varnum

3.8.1 Physical Description and Existing Conditions

Fort Varnum/Camp Varnum is currently an Army National Guard training facility located off Cormorant Road on Cormorant Point in Narragansett overlooking Narragansett Bay and the Atlantic Ocean. According to property records, the property currently consists of over 41 acres. Per review of aerial mapping, there are currently approximately 25 buildings on the property, the majority of which were constructed prior to 1963.

3.8.2 Historic Context

Fort Varnum/Camp Varnum was established in 1942 at the beginning of World War II as part of the United States military defense of Narragansett Bay. The fort was built to protect the west passage of Narragansett Bay and named after Revolutionary War Brigadier General James Mitchell Varnum (Sevigny, 2012). The original fort consisted of barracks, a mess hall, classrooms, and fire control towers, as well as other buildings (RIHPHC, 1991). The fort was transferred to the Rhode Island National Guard in 1957 and renamed Camp Varnum (Sevigny, 2012).

3.8.3 NRHP Criteria and the Maritime Visual Setting

Fort Varnum/Camp Varnum was constructed to defend Narragansett Bay. Its location on the coast with views of the Bay and the Atlantic Ocean were necessary for the army to defend the coast.

3.9 Narragansett Pier MRA

3.9.1 Physical Description and Existing Conditions

The Narragansett Pier MRA is located along the coastline of Narragansett Bay and the Atlantic Ocean and consists of residences, resort-related buildings, hotels, religious buildings, the Towers and other buildings dating from circa 1840 to the mid-twentieth century (Roise, 1978).

3.9.2 Historic Context

In the late nineteenth century, Narragansett, along with many other coastal New England towns, transformed from a predominately agricultural community to a summer destination. Hotels, summer cottages, and resorts were constructed along the shorelines for the upper-middle- and upper-class residents of nearby New York, Boston and Philadelphia. The first hotel, the Narragansett House was built in 1856 and by 1871, ten hotels existed at the Pier (RIHPHC, 1991). The Narragansett Casino was designed by McKim, Mead, and White and was constructed between 1883 and 1860. A fire destroyed the complex and other buildings in the vicinity in 1900, leaving only the Towers.

3.9.3 NRHP Criteria and the Maritime Visual Setting

The Narragansett Pier MRA is significant under Criterion A for its association with the transformation of Narragansett from a rural, farming community to a summer resort as well as under Criterion C for its architecture. Many buildings within the MRA were designed by some of the most prominent architects of the time in a variety of styles including Italianate, Second Empire, Stick, Shingle, Queen Anne and Second Empire (Roise, 1978).

The MRA's location along Narragansett Bay as well as its history and existence as a summer resort colony are intrinsic to its maritime setting. Buildings were sited on the water or to have views of the water and were designed for people wanting to escape the heat of the city and be on the water. The most architecturally significant properties are located on the coast, including the Towers and the Life Saving Station.

3.10 The Dunes Club

3.10.1 Physical Description and Existing Conditions

The Dunes Club is addressed as 137 Boston Neck Road. The property is located on 32.16 acres on Little Neck, off Boston Neck Road, on Beach Street, between the road, of Narragansett Bay and the Atlantic Ocean, and the Pettaquamscutt River, also known as the Narrow River (Town of Narragansett, 2022).

There are six resources that contribute to the Dunes Club, the property also has seven noncontributing buildings and structures. The clubhouse is a one-and-a-half-story building with a lantern cupola constructed in 1939 in the colonial revival style. Connected by a wood deck to the east of the clubhouse are a pool constructed in 1928 and one-story bathhouses constructed in 1939. Further east are three U-shaped cabana buildings constructed in 1939. A one-story, gable-roofed staff house constructed in 1939 is located to the north of the clubhouse. The staff house complex is four buildings connected around a central courtyard. The gatehouse is located at the entrance of the property at the intersection of Beach Street and Boston Neck Road. The gatehouse is a hipped-roof turreted building constructed in 1928. All of the buildings, except the gatehouse, have sustained damage in multiple hurricanes and have had alterations and/or partial reconstructions (Youngken, 2015).

3.10.2 Historic Context

With the ease of travel by train and ferry, during the mid-to-late nineteenth century, wealthy families from New York, Philadelphia, and Boston began frequenting the southern New England coast in the summer to get away from the heat of the cities. Resort hotels and summer homes were constructed, and summer colonies and resorts were developed.

In the 1920s the Dunes Club was founded by wealthy summer residents of Narragansett to establish a private club after the casino was destroyed by fire in 1900. The original Dunes Club was constructed between 1928 and 1929. Kenneth Murchison, Jr., an architect from New York, was the original architect and designed the club in the Mediterranean Revival style, which was the popular style for these types of clubs at the time (North Carolina Architects and Builders, 2022; RIHPHC. 1991). The complex was destroyed in the hurricane of 1938, and only the gatehouse and pool remain from the original club (Youngken, 2015).

In 1938-1939 the Dunes Club was reconstructed. The new complex was designed by Thomas Pym Cope, an architect from Philadelphia. Cope designed the clubhouse, bathhouses, cabanas, and staff housing complex as part of the original plan for the club (Youngken, 2015).

3.10.3 NRHP Criteria and the Maritime Visual Setting

The Dunes Club is listed on the NRHP as an "excellent example of the private American beach club facility of the early-to-mid-20th century." The club is significant under Criterion A for its association with coastal Rhode Island, and in particular Narragansett, becoming a summer destination. The Dunes Club was established as a members-only club by summer residents from Philadelphia and New York. The Dunes Club is also significant under Criterion C for its architecture. As stated above, Thomas Pym Cope designed the original Dunes Club complex including the clubhouse, gatehouse, bathhouses, cabanas and staff housing complex (Youngken, 2015).

The Dunes Club located on Little Neck, between the Atlantic Ocean, and the Pettaquamscutt River. As a private beach club, this historic property has a clear maritime setting with access and views of Narragansett Bay and the Atlantic Ocean.

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Ocean Road Seawall Assessment

4.1.1 Purpose and Intended Outcome

This HPTP proposes to complete a study to determine an implementation plan to preserve the Ocean Road seawall. Per the *Town of Narragansett, RI Strategy for Reducing Risks from Natural Hazards in Narragansett, Rhode Island: A Multi-Hazard Strategy,* the Ocean Road Seawall "could be washed out during a storm" due to erosion, flooding and storm surge and there is threat of severe weather, storms, wind and flood damage (Town of Narragansett et al., 2013. The intended outcome is to provide funding to assess the Ocean Road seawall and prioritize repairs and improvements that would enhance protection of the Ocean Road Historic District and preserve the character of existing historic shoreline settings. This measure would also propose the incorporation of such measures in the Town's Hazard Mitigation Plan (Town of Narragansett et al., 2013).

4.1.2 Scope of Work

This work will consist of the following:

- Review existing planning and hazard mitigation documents, guidance. and regulations;
- Conduct a site assessment of current conditions along the seawall, including photographs and documentation of existing conditions;
- Develop a draft plan, including a repair methodology, a list of priorities, schedule/timeline, and accurate cost estimates;
- Distribute the draft plan to the Participating Parties for review and comment; and
- Develop a final plan to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. A qualified coastal engineer or comparable professional will make field observations along the Ocean Road seawall to be compiled and analyzed as part of the current conditions report. Based on the current conditions and in consideration of changing weather patterns and rising sea levels, recommendations for repairs and upgrades to the seawall will be presented to the Town of Narragansett. These recommendations will include a detailed methodology, list of priorities, schedule/timeline and accurate cost estimates for all work. Subsequent to feedback from the Participating Parties, a draft report will be submitted to the Participating Parties for review and comment. A final plan will be developed incorporating the Participating Parties comments and will be distributed to the Participating Parties.

4.1.4 Standards

The project will comply with the following standards:

- Town of Narragansett Code of Ordinances Chapter No. 1081 *Buildings and Building Regulations* (Town of Narragansett, 2020).

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Photographs and documentation of existing conditions.
- Draft plan; and
- Final Plan.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 National Register of Historic Places Nomination for Fort Varnum/Camp Varnum

4.2.1 Purpose and Intended Outcome

The purpose of this mitigation measure is to officially document the history and significance of Fort Varnum/Camp Varnum and the role the property played in the defense of the eastern seaboard during World War II, as well as the role it continues to play in defense of the United States. As stated above, Fort Varnum/Camp Varnum was established in 1942 at the beginning of World War II as part of the United States military defense of Narragansett Bay. The fort was built to protect the west passage of Narragansett Bay and is just one of such military installations constructed during the time. The NRHP nomination will consider the history, need, and development of these facilities with an in-depth focus on this specific property.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Research of available historic sources and existing documentation;
- Field survey, annotated photographs, mapping, and conditions assessments;
- Drafting of a NRHP Nomination Form to be distributed to the Participating Parties for review and comment;
- Development of a final NRHP Nomination Form which addresses comments from the Participating Parties;
- Distribution of the final NRHP Nomination Form to the Participating Parties; and
- Presentation of the final NRHP Nomination Form to the State Historic Preservation Office Review Board.

4.2.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant selected will prepare a draft NRHP Nomination Form, prepared in accordance with applicable National Park Service and RIHPHC guidance. The draft document will include a description of the boundaries and property, a historic context and statement of significance, and all maps and photographs required by National Park Service (NPS) guidance. The draft NRHP Nomination Form will be distributed to the Participating Parties for review and comment. A final draft will be produced by the consultant that incorporates comments and additional information provided by the Participating Parties. The final document will be presented to the Rhode Island State Historic Preservation Office Review Board.

4.2.4 Standards

The project will comply with the following standards:

- The *Secretary of the Interior's Guidance on the Identification of Historic Properties* (36 CFR 800.4);
- The *Secretary of the Interior's Standards and Guidelines – Professional Qualifications Standards, for Archaeology, History, Architectural History and/or Architecture* (62 FR 33708);
- National Park Service's *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*;
- *National Register Bulletin 16a: How to Complete the National Register Registration Form* (NPS, 1997b); and
- RIHPHC guidance.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Preliminary Draft of the NRHP Nomination Form; and
- Revised draft of the NRHP Nomination Form.

4.2.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.3 Historic Context for Summer Cottage/Resort Development

4.3.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in Narragansett. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.3.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;
- Identify and consult with relevant stakeholders and the Participating Parties;
- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.3.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.3.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.3.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.3.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Rhode Island Historic Properties, February 3, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 24 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BLOCK ISLAND SOUTHEAST LIGHTHOUSE, NATIONAL HISTORIC LANDMARK, TOWN OF NEW SHOREHAM, WASHINGTON COUNTY, RHODE ISLAND

[Insert ATTACHMENT 24 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Block Island Southeast Lighthouse, National Historic Landmark
Town of New Shoreham, Washington County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Block Island Southeast Lighthouse, National Historic Landmark
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Block Island Southeast Lighthouse, which is a National Historic Landmark (the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic property.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic property (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

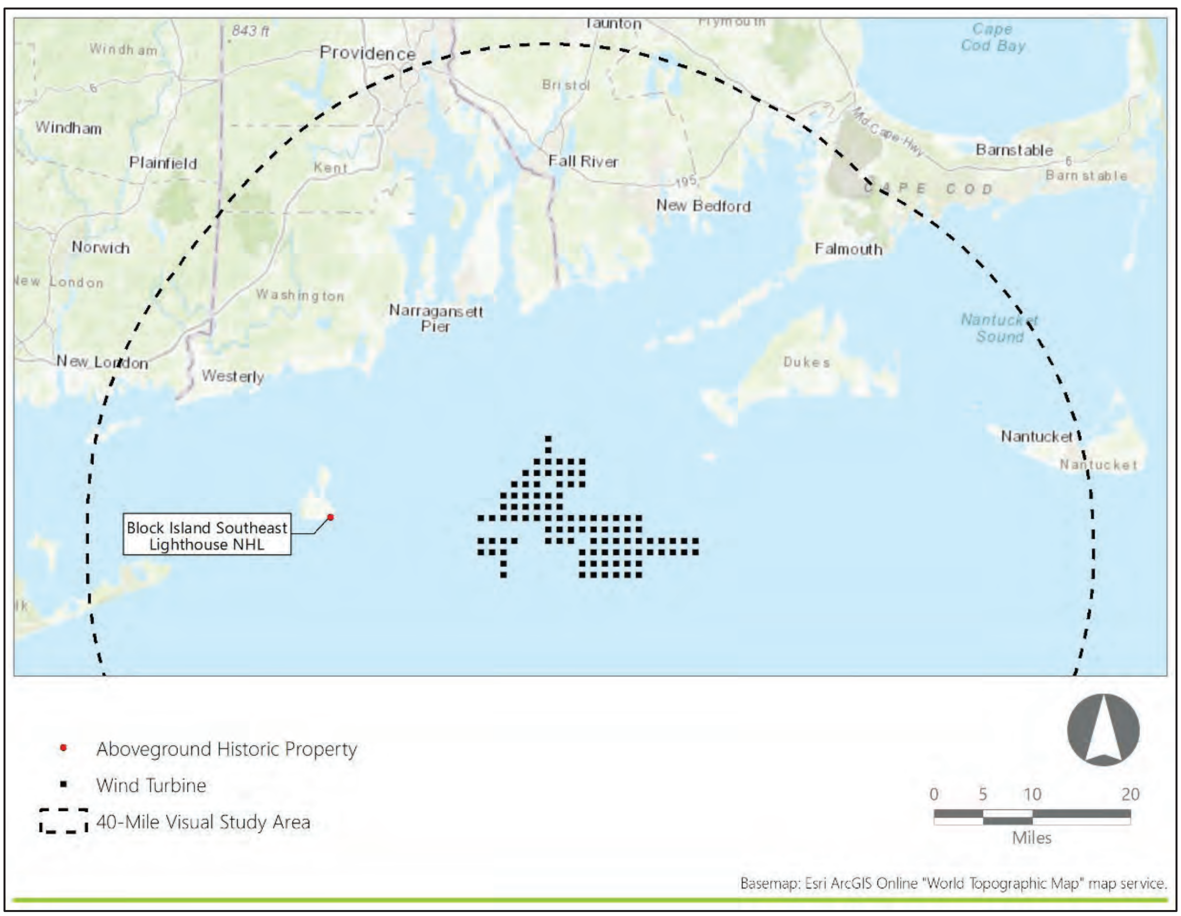
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHLs) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2 – Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. Any mitigation work associated with the historic property will comply with the conditions of all extant historic preservation easements. The Rhode Island Historical Preservation & Heritage Commission holds a Historic Preservation Easement and the United States Coast Guard holds a Aid to Navigation Easement on the historic property. Additional information regarding compliance with extant preservation restrictions appears below in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of New Shoreham
- The Southeast Lighthouse Foundation
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

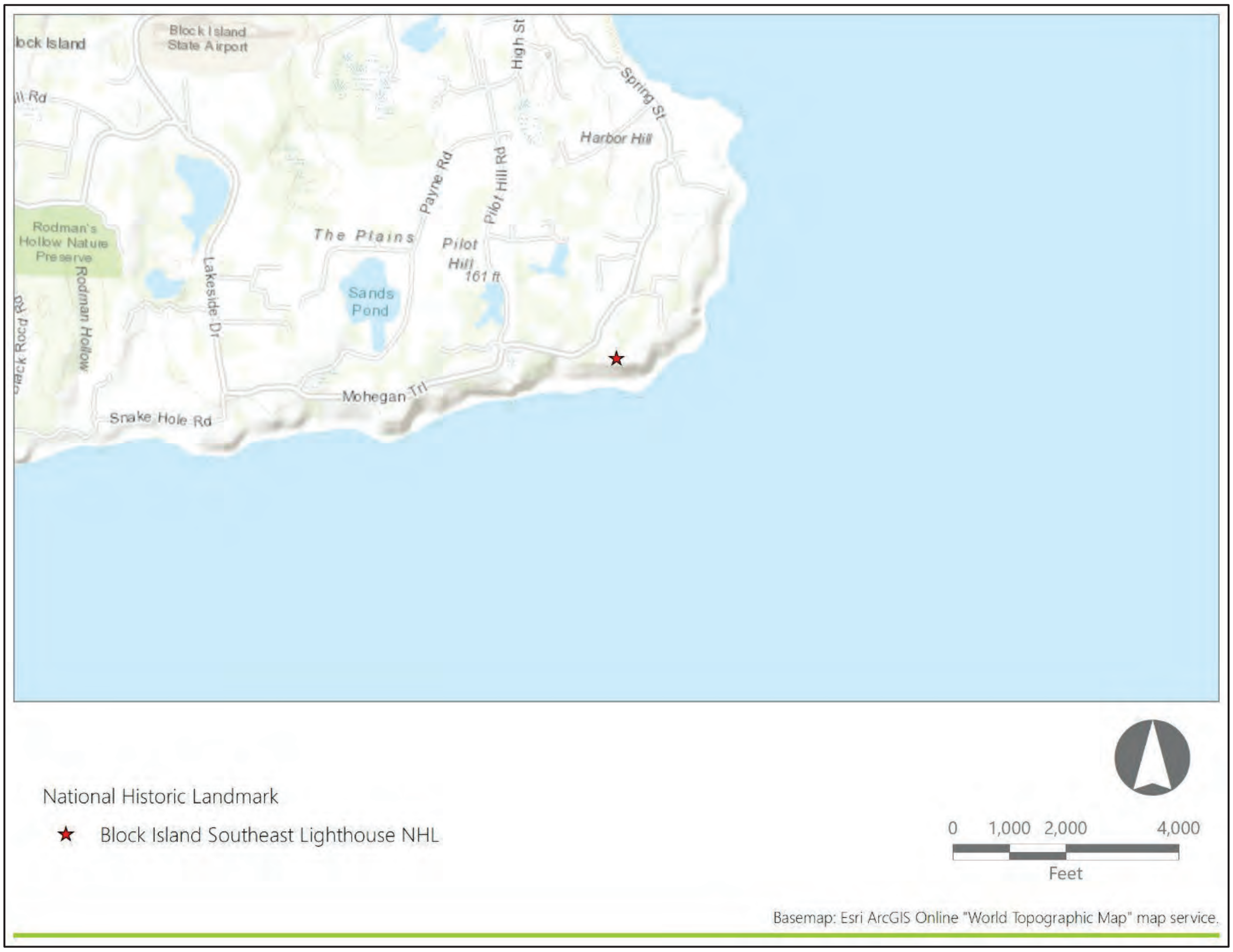
3.1 Historic Properties

This HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.11-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No.	Ownership	Historic Property Type
The Block Island Southeast Lighthouse, National Historic Landmark	National Historic Landmark	Town of New Shoreham	RI	90001131 (NRHP); 97001264 (NHL)	Southeast Lighthouse Foundation (Private)	Lighthouses and Navigational Aids

Figure 3.1-1. Historic Property Location



In Section 3.3, the historic property is considered, both physically and historically with a focus on the contribution of a maritime visual setting to the historic property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The Block Island Southeast Lighthouse, National Historic Landmark is identified in the HRVEA within the historic property type "Lighthouses and Navigational Aids" which is defined by the historic associations with water-related transportation and defense, prominent views of the sea and dominance of the surrounding landscape, and common architectural forms. These structures present themselves as prominent and iconic features on the coastal landscape, possess elevated views of the ocean horizon, and are sited specifically for those elevated views.

Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid.

3.3 The Block Island Southeast Lighthouse, National Historic Landmark

3.3.1 Physical Description and Existing Conditions

The Block Island Southeast Lighthouse, National Historic Landmark is located at 122 Mohegan Trail in the Town of New Shoreham, Rhode Island, on Mohegan Bluff, on the southeast shore of Block Island. Built in 1874 and fully operational by 1875, the Block Island Southeast Lighthouse, National Historic Landmark consists of a five-story, 67-foot-tall octagonal brick tower topped with a copper panel roof. Inside the gallery atop the masonry shaft is a sixteen-sided lantern. A two-and-one-half-story, brick duplex keeper's residence is connected to a one-and-one-half-story kitchen by a hyphen of the same height, both with asphalt shingled gable roofs. Both the tower and the keeper's residence feature granite foundations and trim. In addition, there are two non-contributing buildings on the Block Island Southeast Lighthouse, National Historic Landmark parcel which include a brick garage and Ranch-style house.

The Block Island Southeast Lighthouse, National Historic Landmark is currently set on an approximately 14-acre open parcel. The historic property is located at the end of a sand pedestrian path (Mohegan Trail) off of Spring Street. To the east and west of the buildings are areas of low vegetation, and to the south is the Atlantic Ocean. As the result of over 25 years of rehabilitation efforts, the historic fabric of the Block Island Southeast Lighthouse, National Historic Landmark is intact and well-preserved.

3.3.2 Historic Context

The Block Island Southeast Lighthouse, National Historic Landmark is a rare surviving example of a lighthouse built during a brief period of Victorian Gothic design influence at the U.S. Lighthouse Board and is the sole surviving lighthouse of its high-style design. It was constructed in 1874 by T. H. Tynan of Staten Island, NY and based on the High Victorian Gothic style promulgated by the U.S. Lighthouse Board at the time (Greenwood, 1984). A fixed, six-panel Fresnel lens manufactured in 1873 by Barbier and Fenestre of Paris was installed in the tower and was illuminated by a succession of different fuel sources as time and technology progressed. At the time of its construction, the Block Island Southeast Lighthouse, National Historic Landmark was one of the most advanced lighthouses in the country, both technologically and stylistically. It is noteworthy that the residents of Block Island warned that erosion of the bluffs could pose future hazards to the stability of the lighthouse even before construction began (Reynolds, 1995). The Block Island Southeast Lighthouse, National Historic Landmark a tourist destination owing to the dramatic setting on the bluff. The non-contributing brick garage was constructed in 1939, and a single-story Ranch-style house was constructed by the USCG in 1962 (Reynolds, 1995). During World War Two, a radar tower was built next to the lighthouse and disguised as a water tower (Scofield and Adams, 2012).

Between 1874, when the Block Island Southeast Lighthouse, National Historic Landmark was originally constructed, to the late 1980s, nearly 250 feet of the coastal bluff had been lost to erosion. The USCG began monitoring the erosion of the bluff in the 1950s, and in 1983 local advocacy began in earnest. This resulted in the Block Island Southeast Lighthouse being listed as one of the National Trust for Historic Preservation's "America's Eleven Most Endangered Historic Places" in 1990 and 1991 (Reynolds, 1995). Under the supervision of the US Army Corps of Engineers the lighthouse structure and dwelling were moved approximately 360 feet back from the edge of the bluffs in 1993 (PAL, 2012). At that time the buildings were only approximately 55 feet away from the edge of the bluff. Hydraulic systems were utilized in the lifting and then the moving along metal racks of the nearly 2,000-ton structure. The light tower and dwelling were moved as a single mass, including the above-ground elements of the foundations, to retain the historic fabric. The new location preserves the historic relationship of the lighthouse with seacoast (Reynolds, 1995).

Following the relocation of the Block Island Southeast Lighthouse, National Historic Landmark in 1993, cliff erosion was no longer the biggest threat to the structure. The exterior of the Block Island Southeast Lighthouse has been rehabilitated significantly since its relocation. Rehabilitation efforts have included roof replacement, repointing of brick mortar, window restorations and improvements to the light tower's cast iron elements (SELF, 2021). Recently, interior spaces have been rehabilitated to provide space for a museum, which opened in the summer of 2021 (Block Island Times, 2021).
(Block Island Times, 2021).

3.3.3 NRHP/NHL Criteria and the Maritime Visual Setting

The Block Island Southeast Lighthouse, National Historic Landmark was listed on the NHRP in 1990. It is significant under Criterion A for its historic association with transportation. It is also significant under Criterion C as an outstanding example of High Style Victorian Gothic maritime architecture designed by the U.S. Lighthouse Board (Greenwood, 1990). The period of significance is 1874 with the original construction of the lighthouse to 1929 when the light was illuminated by electricity (Greenwood, 1990). The Block Island Southeast Lighthouse, National Historic Landmark was elevated to an NHL in 1997 under NHL Criterion 1 (Events) due to its strong associations with maritime navigation from its construction to today, and NHL Criterion 4 (Architecture) for its picturesque design and setting. The Block Island Southeast Lighthouse, National Historic Landmark also satisfies Criteria Exclusion 2 as a moved property, since the historic setting and characteristics for which it is significant were not substantively changed as the result of its being removed from the bluff (Reynolds, 1995).

The Block Island Southeast Lighthouse, National Historic Landmark was constructed on the southeast shore of New Shoreham to guide vessels around the dangerous shoals and ledges that surround the Block Island coast. The light is in many instances, the first light seen by vessels crossing the Atlantic Ocean (Greenwood, 1990). In 1929, in order to distinguish the lighthouse from others in the area, the light was replaced with a flashing green light (D'Entremont, 2021). The Block Island Southeast Lighthouse, National Historic Landmark's green light is the only in New England (Greenwood, 1990). Even after the lighthouse was moved inland from its original location, the lighthouse retains its significant maritime setting.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who met Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected, and the heightened significance and standard of care for the NHL. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Cyclical Maintenance Activities and Restoration

4.1.1 Purpose and Intended Outcome

The purpose of this HPTP is to provide funding for the implementation of cyclical maintenance and restoration activities as identified in the cyclical maintenance plan at the Block Island Southeast Lighthouse, National Historic Landmark. The activities of this mitigation measure will be completed in order of priority and may include window restoration and exterior brick repointing and restoration. The intended outcome of this measure is to perform activities to maintain the physical condition, character, and integrity and to ensure the long-term preservation of the Block Island Southeast Lighthouse, National Historic Landmark.

4.1.2 Scope of Work

The scope of work will be determined in consultation with the Participating Parties; however, common practice requires a trained, experienced professional, or team of professionals, to complete physical restoration according to the Secretary of the Interior's Standards for Rehabilitation to ensure the long-term preservation of the Block Island Southeast Lighthouse, National Historic Landmark. Existing conditions, including documentation and photography will be completed prior to any work commencing and as-built documentation and photography will be completed at the end of the project.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The chosen consultant should have a demonstrated knowledge of the treatment of historic properties. Existing conditions, including documentation and photography will be completed prior to any work commencing. All work completed must meet the Secretary of the Interior's Standards and Guidelines for Treatment of Historic Properties (36 CFR 68) and comply with the existing Preservation Restriction. Upon completion of any work, as-built documentation and photography will be completed and provided to the Participating Parties.

4.1.4 Standards

The project will comply with the following standards:

- The Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations;
- The Town of New Shoreham Historic District Commission;
- United States Coast Guard Aid to Navigation (ATON) Access Easement (U. S. Department of Homeland Security and U. S. Coast Guard, 2005);
- *Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* (Nelson, 1988);
- *Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings;*
- *National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation;*
- *Historic Lighthouse Preservation Handbook;*
- *IALA-AISM Lighthouse Conservation Manual;*
- Preservation Restriction (RIGL Title 42, Section 42-45-9); and
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68); and
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFP;
- Proposals by qualified consultants in response to the RFP;
- Existing conditions documentation including photographs;
- Draft plans and specifications, if applicable;
- Final plans and specifications, if applicable;
- As-built documentation, including photographs; and
- Other documentation, as required.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[2] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Southeast Lighthouse, National Historic Landmark, February 7, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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Applicant-Proposed Draft – Subject to Review and Comment by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Mill Creek Swamp #1 and #2 Sites, Town of North Kingstown, Washington County, Rhode Island

Submitted to:

BOEM
Bureau of Ocean Energy Management

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind | Powered by Ørsted & Eversource

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

EDR

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July 2022

ATTACHMENT 25 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THIRTY-ONE HISTORIC PROPERTIES, TOWN OF NEW SHOREHAM, WASHINGTON COUNTY, RHODE ISLAND

[Insert ATTACHMENT 25 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Thirty-one Historic Properties
The Town of New Shoreham, Washington County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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217 Montgomery Street, Suite 1100
Syracuse, New York 13202
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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	Thirty-one Historic Properties in the Town of New Shoreham, Washington County, Rhode Island
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Regulation
HPTP	Historic Property Treatment Plan
MA SHPO	Massachusetts State Historic Preservation Officer
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NHL	National Historic Landmark
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service

NRHP	National Register of Historic Places
RFP	Request for Proposals
RI SHPO	Rhode Island State Historic Preservation Officer
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
SOI	Secretary of the Interior
USCG	United States Coast Guard
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for 31 properties in New Shoreham (See Table 3.1-1, hereinafter, the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location and Old Harbor Historic District and New Shoreham Historic District Location Map

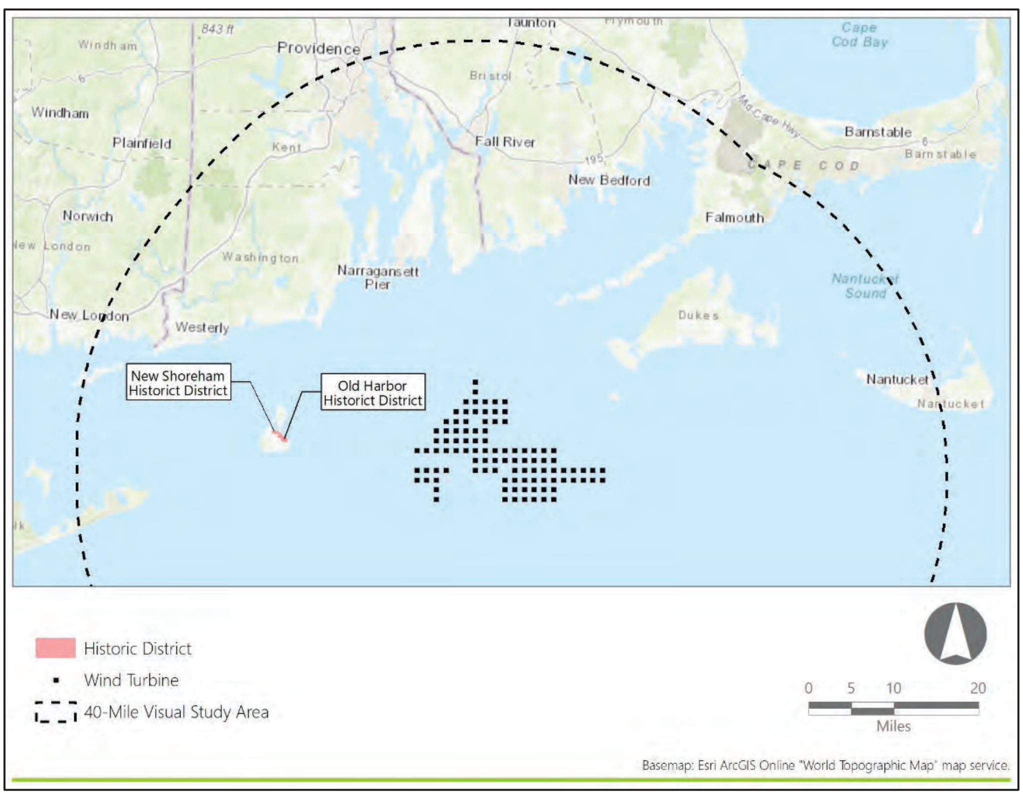


Figure 2.1-2. Project Location and Northern New Shoreham Location Map

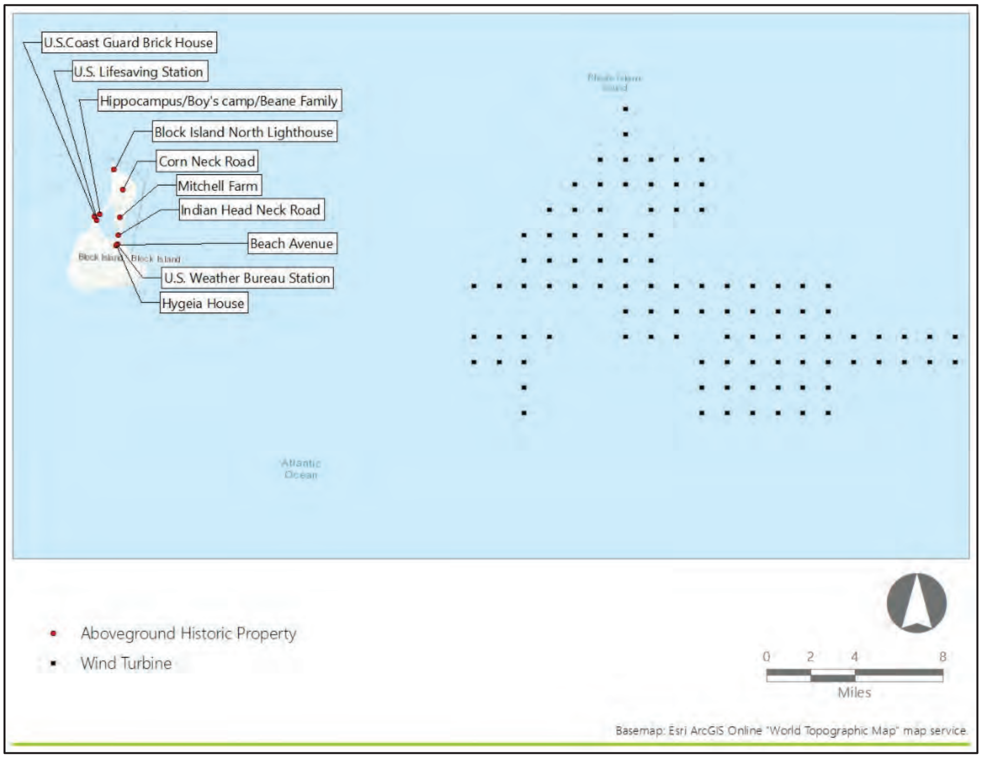


Figure 2.1-3. Project Location and Interior New Shoreham Location Map

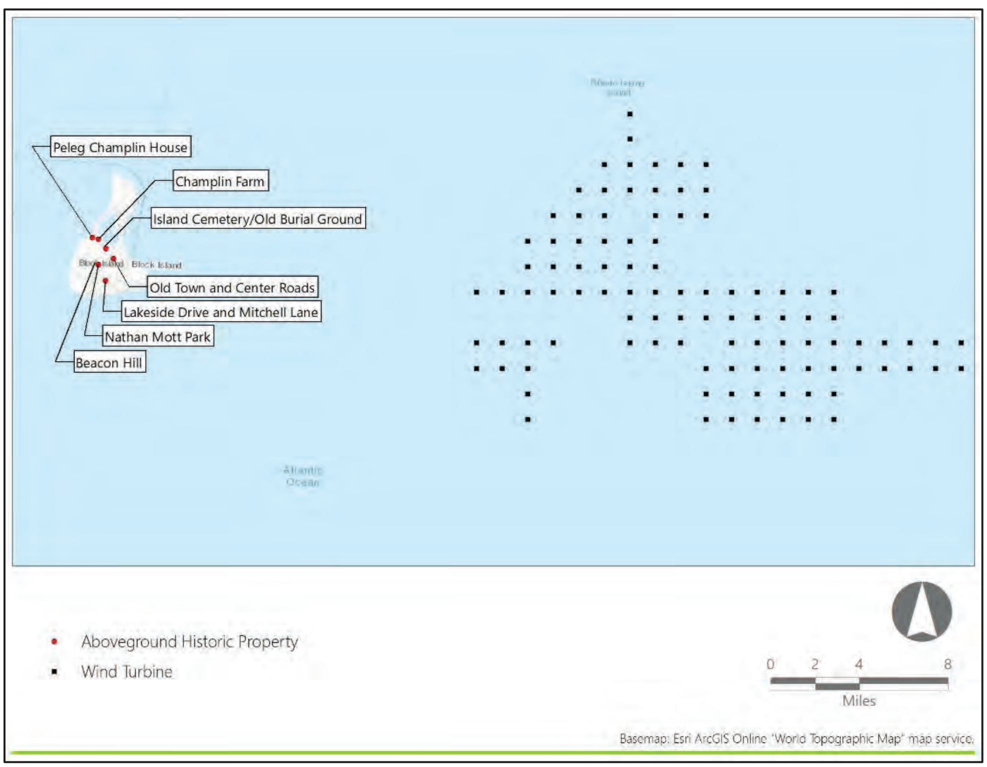


Figure 2.1-4. Project Location and Southern New Shoreham Location Map

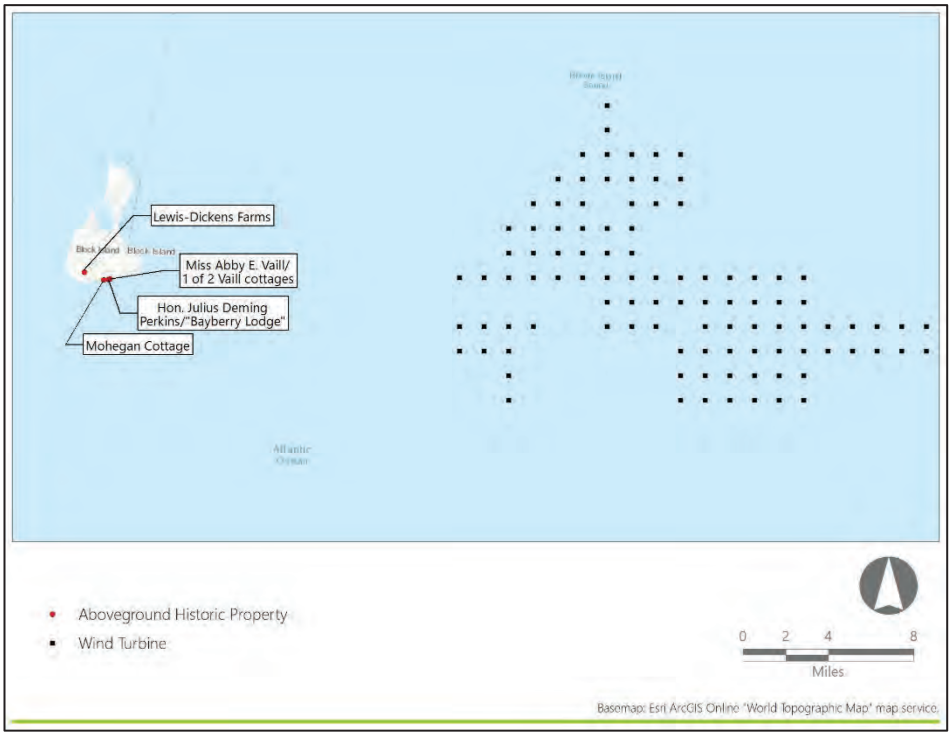
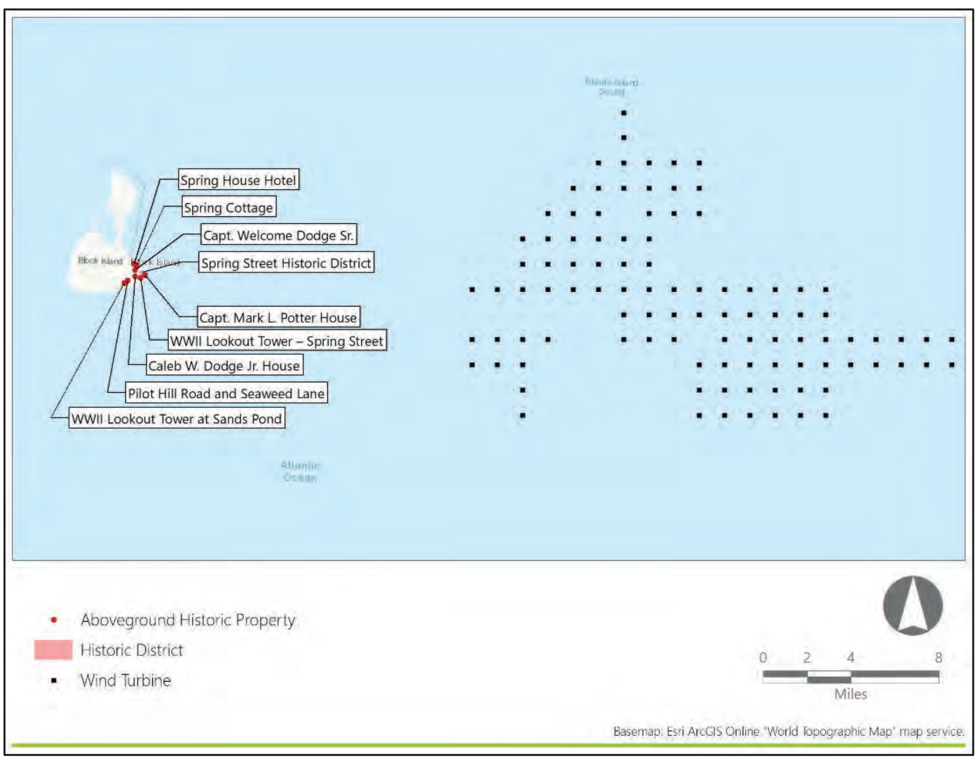


Figure 2.1-5. Project Location and Southeastern New Shoreham Location Map



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks (NHL) for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The MOA identifies certain preservation restrictions and easements applicable to specific properties in Stipulation III.C.1. The Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. Any mitigation work associated with the Historic Properties will comply with the conditions of all extant historic preservation easements. The Rhode Island Historical Preservation & Heritage Commission holds a Historic Preservation Easement on the Spring House Hotel. Additional information regarding compliance with extant preservation restrictions appears below in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic properties and invited the following parties:

- The Town of New Shoreham
- The Block Island Historical Society
- The U.S. Coast Guard
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

This HPTP involves thirty-one historic properties, as identified in Table 3.1-1 and located Figures 3.1-1, 3.3-1, 3.4-1, 3.5-1, 3.6-1, and 3.7-1.[2]

Table 3.1-1. Historic Properties included in the HPTP[3]

Name	Property Designation	Site No. (Agency)	Geographic Context	Historic Property Type
The Old Harbor Historic District	NRHP-Listed	74000012 (NPS)	The Old Harbor Historic District	Historic Buildings and Structures
New Shoreham Historic District	Local Historic District	N/A	New Shoreham Historic District	Historic Buildings and Structures
The Corn Neck Road Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.B (RIHPHC)	Northern New Shoreham	Historic Buildings and Structures
The Indian Head Neck Road Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.D (RIHPHC)		Historic Buildings and Structures
The Hippocampus/Boy's Camp/Beane Family	NRHP-Eligible (RIHPHC Determined)	PAL.307 (RIHPHC)		Historic Buildings and Structures
The Mitchell Farm	NRHP-Eligible (RIHPHC Determined)	PAL.C (RIHPHC)		Historic Buildings and Structures
The U.S. Lifesaving Station	NRHP-Eligible (RIHPHC Determined)	PAL.39 (RIHPHC)		Maritime Safety and Defense Facilities
The U.S. Coast Guard Brick House	NRHP-Eligible (RIHPHC Determined)	PAL.305 (RIHPHC)		Maritime Safety and Defense Facilities
The U.S. Weather Bureau Station	NRHP-Listed	Ref 83000006 (NPS)		Historic Buildings and Structures
The Hygeia House	NRHP-Listed	Ref 1001156 (NPS)		Recreational Properties

[2] Note the Block Island Southeast Lighthouse, National Historic Landmark and the Block Island North Light are included in separate HPTPs.

Name	Property Designation	Site No. (Agency)	Geographic Context	Historic Property Type
The Peleg Champlin House	NRHP-Listed	Ref 82000016 (NPS)		Historic Buildings and Structures
The Beach Avenue Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.E (RIHPHC)		Historic Buildings and Structures
The Lakeside Drive and Mitchell Lane Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.J (RIHPHC)	Interior New Shoreham	Historic Buildings and Structures
The Nathan Mott Park	NRHP-Eligible (RIHPHC Determined)	PAL.237 (RIHPHC)	Interior New Shoreham	Recreational Properties
The Champlin Farm Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.296 (RIHPHC)	Interior New Shoreham	Agricultural Properties
Island Cemetery/Old Burial Ground	RI Historic Cemetery	BI 1	Interior New Shoreham	Historic Cemeteries and Burial Grounds
The Old Town and Center Roads Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.F (RIHPHC)	Interior New Shoreham	Historic Buildings and Structures
The Beacon Hill Road Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.M (RIHPHC)	Interior New Shoreham	Historic Buildings and Structures
The Mohegan Cottage	NRHP-Eligible (RIHPHC Determined)	PAL.169 (RIHPHC)	Southern New Shoreham/Mohegan Bluffs	Historic Buildings and Structures
The Lewis Farm and Dickens Farm Road Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.K (RIHPHC)	Southern New Shoreham/Mohegan Bluffs	Agricultural Properties
The Miss Abby E. Vaill/1 of 2 Vaill Cottages	NRHP-Eligible (RIHPHC Determined)	PAL.131 (RIHPHC)	Southern New Shoreham/Mohegan Bluffs	Recreational Properties
The Hon. Julius Deming Perkins/"Bayberry Lodge"	NRHP-Eligible (RIHPHC Determined)	PAL.130 (RIHPHC)	Southern New Shoreham/Mohegan Bluffs	Recreational Properties
Spring Street Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.110 (RIHPHC)	Southeastern New Shoreham	Historic Buildings and Structures
The Caleb W. Dodge, Jr. House	NRHP-Eligible (RIHPHC Determined)	PAL.110 (RIHPHC)	Southeastern New Shoreham	Historic Buildings and Structures

Name	Property Designation	Site No. (Agency)	Geographic Context	Historic Property Type
The Captain Mark L. Potter House	NRHP-Eligible (BOEM Determined)	GAY.900 (RIHPHC)		Historic Buildings and Structures
The Captain Welcome Dodge, Sr. House	NRHP-Eligible (RIHPHC Determined)	PAL.105 (RIHPHC)		Historic Buildings and Structures
The Pilot Hill and Seaweed Lane Historic District	NRHP-Eligible (RIHPHC Determined)	PAL.H (RIHPHC)	Southeastern New Shoreham	Historic Buildings and Structures
The Spring House Hotel Cottage	NRHP-Listed	PAL.100 (RIHPHC)		Recreational Properties
The Spring House Hotel	NRHP-Listed	PAL.99 (RIHPHC)		Recreational Properties
The WWII Lookout Tower at Sands Pond	NRHP-Eligible (RIHPHC Determined)	PAL.137 (RIHPHC)		Maritime Safety and Defense Facilities
The WWII Lookout Tower- Spring Street	NRHP-Eligible (RIHPHC Determined)	PAL.82 (RIHPHC)		Maritime Safety and Defense Facilities

3.1.1 Historic Context of New Shoreham

Block Island was home to Native Americans for thousands of years prior to its initial "discovery" by European explorers. Archaeological studies indicate indigenous people were visiting or living on the island at least 7,000 years ago. Giovanni da Verrazzano is credited with discovering and describing the inhabited island during a 1524 voyage to the New World. Sixteen families moved to Block Island in 1662, representing the first permanent European settlement in present-day New Shoreham. For the next two centuries the island's residents developed a significant fishing and processing industry for fish products. Enslaved Africans were among the island's earliest post-Contact Period inhabitants. A National Harbor was established early in the Island's history, and seasonal tourism began in the early-to-mid nineteenth century. Block Island's proximity to major northeastern cities, as well as its natural scenic landscape and charm led to its development as a summer destination. Development of inns, hotels, and other amenities increased around the harbor in the mid-nineteenth century, with the first public house built in 1842 (Gibbs, 1974). As transportation to the island improved with the first recreational steamboat in 1858, the development of summer beach cottages increased. By the mid-nineteenth century it became known as the "Bermuda of the North." The present harbor was constructed between 1870 and 1876 consisting of two rip-rap granite breakwaters that remain relatively unchanged to this day. Although many tourists stayed in boarding houses, inns, and hotels, seasonal summer cottages were being constructed in large numbers by the mid-1880s. It was well-established as a recreation destination for the regional elite by 1890 (Scofield and Adams, 2012).

The resort economy had declined in the first half of the twentieth century but rebounded with the construction of an airport in 1950 (Gibbs, 1974). By the early 1970s, pressure from new development spurred the creation of the Block Island Conservancy. This effort has contributed to the preservation of open rural spaces on the island and the historic fabric of much of the island's-built environment (PAL, 2012).

3.1.2 NRHP Criteria and the Maritime Visual Setting

The maritime significance of Block Island is well articulated in the 1991 *Historic and Architectural Resources of Block Island, Rhode Island* prepared by the Rhode Island Historic Preservation & Heritage Commission (RIHPHC) as part of a statewide effort to identify and record properties of historic and cultural significance. This survey included a lengthy, well-researched historic context and supporting documentation, including photographs.

Areas of significance described in the *Historic and Architectural Resources of Block Island, Rhode Island* report include "Structures Associated with Block Island's Maritime History" (RIHPHC, 1991), which contains the following description:

> *The special relationship of the island and the surrounding sea is documented in a number of buildings and engineering works-lighthouses, piers, breakwaters, harbors, life-saving stations, and a weather station. The old harbor, both lighthouses, and the weather station are already listed on the Registers, recognizing the importance of maritime concerns the history of the island. If additional structures associated with the sea-faring history of the island are located, they may also be eligible if they retain integrity and if their relationship with Block Island's maritime history is clearly demonstrated* (RIHPHC, 1991).

In addition, the survey report includes "Farms" (RIHPIC, 1991), which contains the following description:

> *The patterns of their agricultural practices have determined, in part, the visual quality of the island today-the cleared land, the low scrub growth, the patchwork of fields intersected by lanes and walls. For several hundred years farming was not only a means of livelihood, but a way of organizing the landscape* (RIHPHC, 1991).

The survey report also includes "Buildings Associated with Block Island as a Resort" (RIHPHC, 1991), which contains the following description:

> *The enormous changes brought to Block Island from the mid-nineteenth century on by the change from relative isolation to a summer resort for vacationers from elsewhere are well documented by some of the island's most important buildings. The construction of boardinghouses, hotels, commercial buildings, and private summer cottages introduced new building forms and types and new patterns of development. In addition, buildings associated with Block Island's history as a resort reflect the introduction of mainstream stylish architectural ideas to the island. The vernacular tradition had continuing vitality, but was now paralleled by the flow of new architectural directions expressed particularly in summer houses.*
>
> *Buildings associated with Block Island's development as a resort may be eligible for the Registers if they are sufficiently well preserved to evidence their type; if they represent a building form introduced to the island as a result of resort development; if they retain their*

mass, form, plan, at least some detail and finish; and if they provide evidence of the introduction of mainstream architectural ideals to the island (RIHPHC, 1991).

The survey report also includes "The Landscape" (RIHPIC, 1991) which includes the following description:

> *On Block Island, more than in most places, the entire assemblage of historic· and natural features has great beauty and significance. Isolated buildings and natural features can be singled out, identified, and treated as remarkable, but this approach will miss the most exceptional aspect of Block Island-that the entire environment is a vivid historic landscape of great appeal (RIHPHC, 1991).*

In each instance, these expanded areas of significance speak directly to the connection that the elements of the New Shoreham Historic Properties have to the sea. Additional historic architectural surveys in 2007 (Gasner, 2007) and 2012 (PAL, 2012) each provided updated recommendations of NRHP eligibility based on established criteria and areas of significance. In addition, a Multiple Property Documentation Form was prepared for Block Island in 2012 that once again revisited the historic context of Block Island and identified five distinct property types with well-defined statements of significance (Scofield and Adams, 2012).

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

The historic properties identified in this HPTP are included within the following property types as defined in the HRVEA: "Historic Buildings and Structures," "Historic Cemeteries and Burial Grounds," "Agricultural Properties," "Recreational Properties," and "Maritime Safety and Defense Facilities." Each property type is defined below as well as the characteristics typical of their maritime setting.

"Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the "Estates and Estate Complexes" property type (see below). These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Historic Buildings and structures not fitting within the previously described types occur throughout the study area and in a variety of local contexts. Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic structures were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and Historic Buildings frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

"Historic Cemeteries and Burial Grounds" consists of cemeteries identified by federal, state, or local governmental agencies as having historic significance. These above-ground historic properties may be municipally owned cemeteries on public land, small family plots on private land, or abandoned burial grounds. Historic cemeteries are lasting memorials to the past, provide a guide to the changing values and composition of communities in the course of their historic development.

Typically, cemeteries and burial grounds are not eligible for listing in the NRHP except when they satisfy NPS Criteria Consideration D:

> *"d. A cemetery which derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events"* (NPS, 1990).

Historic cemeteries in the State of Rhode Island are designated and protected as historic resources apart from the NRHP by the Rhode Island Historical Cemetery Commission (RIHCC) and are referred to in the official literature as Rhode Island Historical Cemeteries. Under Chapter 23-18 of the Rhode Island General Law (RIGL), each city and town is required to identify and register historic cemeteries and the RIHCC is empowered to "study the location, condition, and inventory of historical cemeteries in Rhode Island and to make recommendations to the general assembly relative to historical cemeteries in Rhode Island" (RIGL §23-18, 2006.

Historic cemeteries and burial ground vary throughout the study area. Small, private, non-denominational and family cemeteries were relatively common in New England, and many have survived to present-day. Many examples of small cemeteries were associated with specific farms or families and were frequently placed within the available agricultural lands surrounding a farmstead or near multiple associated family farms. Where such burial grounds are located near the water they may be associated with ocean or other maritime viewsheds, however, ocean vistas are less likely to have been a significant consideration in the siting of such cemeteries than their larger, more formal counterparts in the region. Where cemeteries are located within districts or other historic settlements strongly associated with maritime settings, such burial grounds may be sited to maintain a visual connection to the waters in order to maintain a sense of continuity linking the departeds' final resting places with the environment in which they lived. Cemeteries in urban locations expressing such patterns may include formal design elements associated with the "rural cemetery movement" of the 19th century, which sought to create naturalistic, park-like settings to express "an appreciation of nature and a sense of the continuity of life" (NPS National Register Bulletin 41: 6). Maritime views from hillside cemeteries that were intentionally incorporated or framed by landscape designs may be more sensitive to discordant modern elements than those associated with less formal burial grounds that may not have been specifically located to provide ocean views.

“Recreational Properties” is defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish. These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities.

“Agricultural Properties” consist of historic farm buildings and landscapes which have retained a high degree of integrity and are generally no longer used for their original purpose. These above-ground historic properties feature barns, farmhouses, and large, open tracts of pastureland. They are not located at the shoreline or immediately adjacent to the sea but are situated such that the local topography places them within the PAPE. Generally, these above-ground historic properties do not derive their significance in any direct way from the ocean or maritime activities.

Historic agricultural properties, including farms, farmhouses, barns and related buildings and structures are relatively common in the study area. Many of these properties were built between 1700 and 1850, after which agricultural economies in New England and New York declined sharply. The historic settings for such properties typically include open, agrarian landscapes which once may have afforded open views of the seas when sited along the shoreline or at higher elevations within the coastal interior. Few of the once expansive agrarian landscapes associated with the historic use of the region’s farms survive. Some have been altered by later residential and commercial development and many have been transformed by reforestation. Despite these changes, historic agricultural properties remain an important part of the region’s heritage and tangible expression of several centuries of intensive farming that transformed the landscapes throughout southern New England and eastern Long Island.

“Recreational Properties” is defined by the role these properties served in their original functions as places for the resort tourism economy of the late-nineteenth century to flourish. These above-ground historic properties feature beaches, casinos, restaurants, and other buildings and structures built to entertain seasonal vacationers. They are typically located near the shoreline or immediately adjacent to the sea, and in some cases, are the beaches themselves. The enjoyment of, and interaction with, the sea are integral features of the significance of these above-ground historic properties. In many cases, the beachfront, shoreline, and adjacent ocean waters are prominent features of the historic setting due to their close association with historic recreational activities.

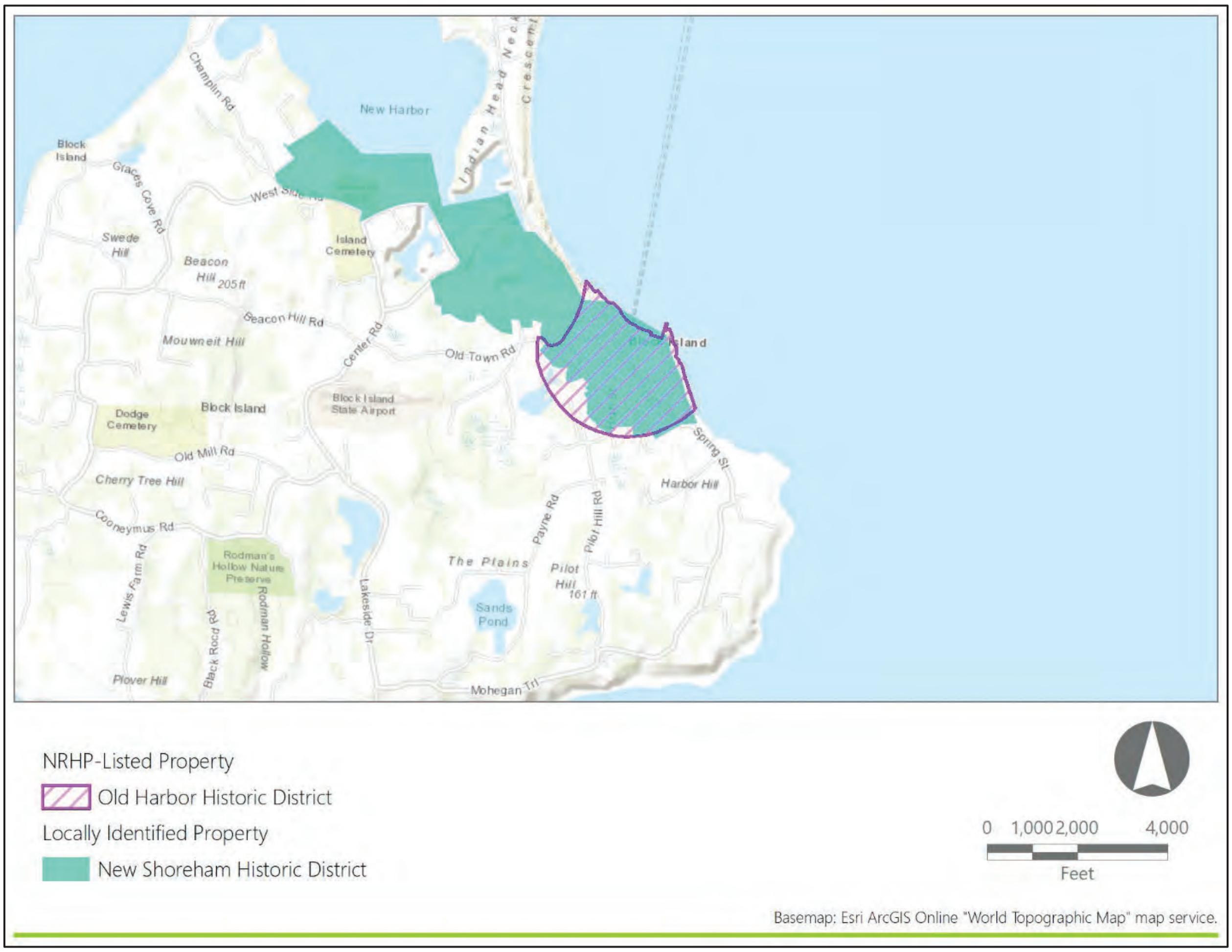
The same macroeconomic trends that saw the decline of the quintessential New England farm in the mid-19th century are associated with a population shift to cities and rise in affluence for some segments of society. Summer resorts, supported by steamships, rail transportation, and eventually, automobiles were developed in numerous locations in the study area in the late 19th century. These resorts varied between properties intended to serve the rising group of "upper middle income" families living in the region's cities to estate-like developments serving a more affluent set. Seaside resorts, like many other shoreline recreational, commercial, and residential properties, were often sited to take advantage of aesthetically pleasing ocean or maritime views. Depending on location and the the conformation of the local shoreline, such properties may be associated with specific bay or cove viewsheds that include limited areas of the open ocean waters. Recreational activities at resorts frequently included swimming and designated beaches where residents and visitors may have spent considerable time during the summer months. Where these features are still present and express a tangible association with the historic resort property, views from beaches may be as important as views from more formal elements of the designed landscape. Likewise, historic hotels and inns became more common elements of the region's shoreline communities in the late 19th century. Such properties were often sited near harbors, ferry landings, rail stations, and public or private beaches and may be associated with similar historic maritime settings. Views to ocean waters or the more intimate bays and coves of the region may have been an integral part of the visitor's motivation for staying in such establishments. Such considerations can be expressed through the inclusion of building and landscape features clearly intended to afford views of ocean. Older taverns and inns in the study area may be found along the working harbors and ports and were intended to serve the fishing, whaling, and related participants in maritime commerce. The design and location of these properties may not show the same influence of aesthetic considerations but will likely also retain a strong association with the waterfront and maritime environment.

"Maritime Safety and Defense Facilities" consists entirely of facilities erected by bureaus of the U.S. Department of Defense or their predecessors and share historic associations with coastal defense. These structures vary in their design and construction materials but are unified by their historic functions of rescuing and protecting maritime transportation in the area, or for coastal defense.

Historic military and maritime safety properties along the shoreline will likely be associated with maritime settings. Aesthetic considerations in the siting of such facilities may or may not be expressed in the design of buildings, structures, and landscapes depending on the age and specific functions of the property. Proximity to navigation channels, defensibility, and the presence of existing shipbuilding or repair infrastructure in a broader maritime context may have been significant considerations in the siting of naval facilities. Such factors may not demonstrate a significant association with open ocean viewsheds. The study area includes several significant examples of World War II-era defense structures, including fire control or observation towers designed to monitor specific parts of the maritime environment. Early lifesaving stations were likewise intended to provide for observation of marine waters in the vicinity of know hazards or where storms posed specific risks to sea-going or coastal vessels. Lifesaving stations were also frequent located where rescue boats or other vessels might be safely launched under treacherous conditions. These locations may have included inlets, harbors or coves adjacent to open waters where rescue and recovery efforts would likely be made.

Maritime settings for historic piers, marinas, and related marine infrastructure are likely to include strong associations with specific harbors, coves, and bays where related activities were focused, and which exerted a significant influence on the design and construction of the historic infrastructure. The relationship of such local settings to ocean waters and the extent to which open ocean views represent an important element of a specific historic property's setting will vary depending on the orientation of the shoreline and the location of the historic property. The size and location of historic buildings and structures relative to each other and other elements of the surrounding environment may also be important to the overall integrity of historic maritime infrastructure.

Figure 3.1-1. Old Harbor Historic District and New Shoreham Historic District Location Map



3.2 Old Harbor Historic District

3.2.1 Physical Description and Existing Conditions

The NRHP-listed Old Harbor Historic District in located in the Town of New Shoreham, Block Island, encompasses an onshore radius of 2,000 feet from the statue of Rebecca at the center of New Shoreham Village Square, located at the intersection of Water, High, and Spring Streets. It is bound to the east by the

Atlantic Ocean and the shoreline. The district includes sections of Chapel, Dodge, High, Main, Spring, and Water Streets and consists of 42 contributing resources, including buildings and sites (Gibbs, 1974).

3.3 New Shoreham Historic District

3.3.1 Physical Description and Existing Conditions

The New Shoreham Historic District is a local historic district/historic district overlay (Town of New Shoreham Historic District Commission, 2022a). The historic district is located along Spring, Water, and Ocean Avenues and Corn Neck Road roughly bounded to the southeast by Amy Dodge Lane; to the northeast by Trims Pond; to the north by Great Salt Pond; and to the west at the intersection of West Side and Champlin Roads (Town of New Shoreham GIS, 2022). There are 321 parcels located within the boundaries of the district including the Old Harbor Historic District, residences, commercial buildings, town-owned properties, and vacant land (Town of New Shoreham Historic District Commission, 2022b).

The topography within the district is that of relatively low and gently rolling hills, with some slightly higher elevations around the periphery, such as along Old Town Road to the west and Spring Street to the south. The buildings within the district include three-and-one-half- and four-and-one-half-story hotels and inns facing the ocean along Water Street, and smaller one-and-one-half- and two-and-one-half-story residences inland and just outside of the village center. The extant historic buildings feature architectural styles of the mid- to late-nineteenth century, such as Gothic Revival, Second Empire, and Queen Anne. Many recently constructed buildings feature matching forms and materials evocative of this period, helping to maintain the historic feeling and association with the district's period of significance. Mansard roofs are common, especially on the hotels and inn buildings, while the residences typically feature gables. Powerful storm surges attributed to global climate change have increased in recent years, leading to damage to both man-made and natural resources within the district (Kelly, 2021). This situation has increased the need for major planning and conservation efforts on Block Island.

3.3.2 Historic Context and Maritime Visual Setting

The Old Harbor Historic District was originally listed on the NRHP under Criteria A (Recreation) and C (Architecture). According to the NRHP Inventory Nomination Form, the district's "... significance lies chiefly in its transformation from a landing site for this early community and modest fishing hamlet, to one of the most popular resorts in America" (Gibbs, 1974). The NRHP document places emphasis on the importance of the construction of the harbor and its breakwaters, relating their completion to the beginning of the growth of the district's significant buildings and the establishment of Block Island as a premier resort destination, specifically noting the following areas of significance:

- Architecture;
- Commerce;
- Engineering;
- Transportation; and
- Other – Maritime Recreation.

Therefore, while the original nomination is nearly 50 years old, the following statement taken from the statement of significance section remains accurate: "Old Harbor is still the only considerable village and remains sharply defined, as a geographical district, amidst the sprawling farm cottages of the countryside" (Gibbs, 1974).

The maritime significance of the district was further elaborated upon in the 1991 *Historic and Architectural Resources of Block Island, Rhode Island* prepared by the RIHPHC. This survey included a lengthy, well-researched historic context and supporting documentation for Old Harbor, including photographs. This historic context established a basis for a subsequent section that expanded on the areas of significance that were noted briefly in the NRHP Inventory Nomination Form.

These areas of significance include "Structures Associated with Block island's Maritime History" (RIHPHC, 1991), which contains the following description:

> *The special relationship of the island and the surrounding sea is documented in a number of buildings and engineering works-lighthouses, piers, breakwaters, harbors, life-saving stations, and a weather station. The old harbor, both lighthouses, and the weather station are already listed on the Registers, recognizing the importance of maritime concerns the history of the island. If additional structures associated with the sea-faring history of the island are located, they may also be eligible if they retain integrity and if their relationship with Block Island's maritime history is clearly demonstrated* (RIHPHC, 1991).

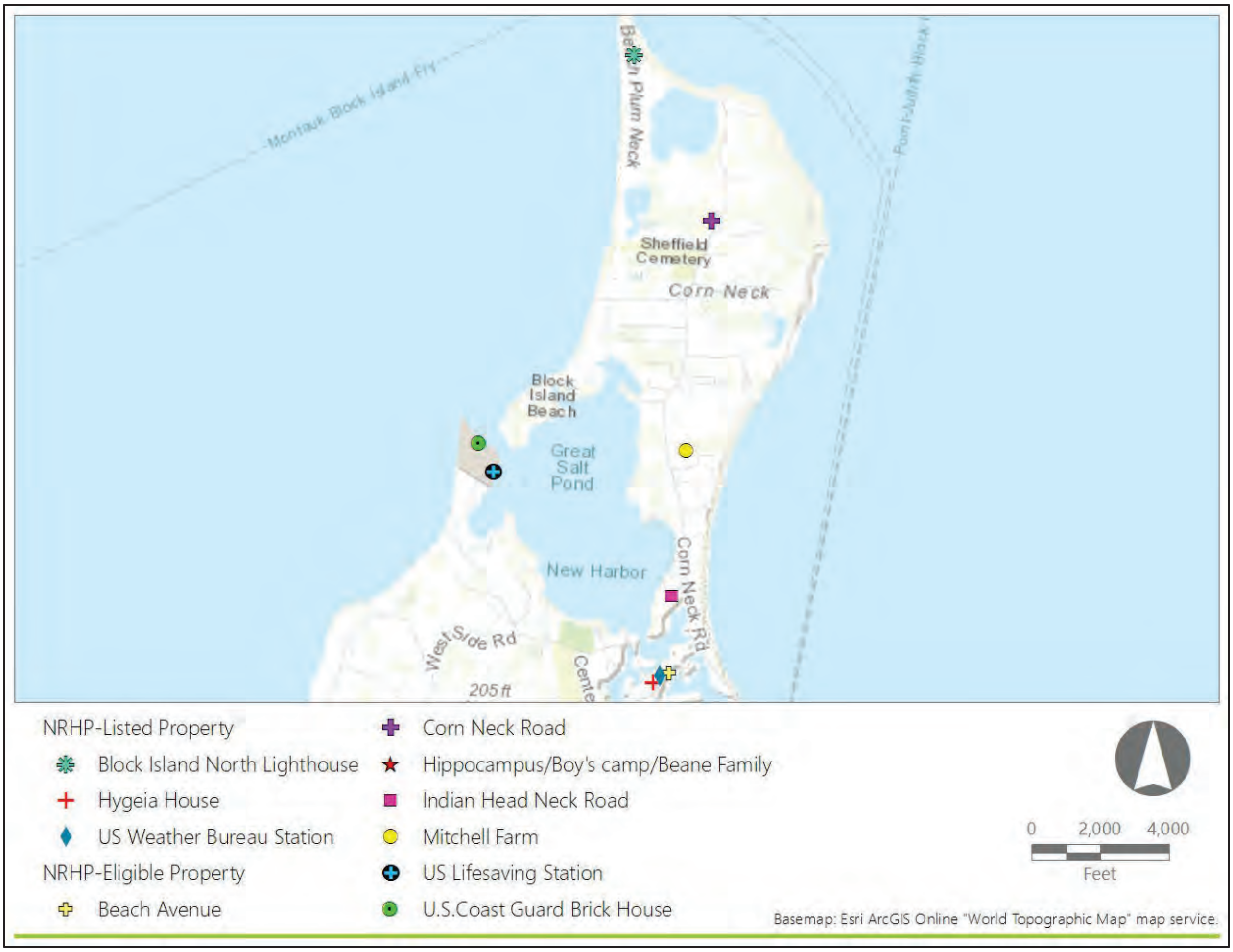
In addition, the survey report includes "Buildings Associated with Block Island as a Resort" (RIHPHC, 1991), which contains the following description:

> *The enormous changes brought to Block Island from the mid-nineteenth century on by the change from relative isolation to a summer resort for vacationers from elsewhere are well documented by some of the island's most important buildings. The construction of boardinghouses, hotels, commercial buildings, and private summer cottages introduced new building forms and types and new patterns of development. In addition, buildings associated with Block Island's history as a resort reflect the introduction of mainstream stylish architectural ideas to the island. The vernacular tradition had continuing vitality, but was now paralleled by the flow of new architectural directions expressed particularly in summer houses.*
>
> *Buildings associated with Block Island's development as a resort may be eligible for the Registers if they are sufficiently well preserved to evidence their type; if they represent a building form introduced to the island as a result of resort development; if they retain their mass, form, plan, at least some detail and finish; and if they provide evidence of the introduction of mainstream architectural ideals to the island* (RIHPHC, 1991).

These expanded areas of significance speak directly to the connection that the elements of the built environment in the district have to the sea, including the engineering feats associated with the breakwaters and the inner basin, as well as the alignment of Water Street parallel to the shore. The other expanded areas of significance include Early Houses (before 1850), Farms, and The Landscape, which also have some relevance to the contributing properties of the district. Further historic architectural surveys in 2007 (Gasner, 2007) and 2012 (PAL, 2012) each provided updated recommendations of NRHP eligibility based on established criteria and areas of significance. In addition, a Multiple Property Documentation Form was prepared for Block Island in 2012 that once again revisited the historic context of Block Island and identified five distinct property type with well-defined statements of significance (Scofield and Adams, 2012).

3.4 Northern New Shoreham Historic Context and Maritime Setting

Figure 3.4-1 Northern New Shoreham Location Map



Northern New Shoreham was clear-cut early in its colonial history in order to facilitate farming. While the agricultural economy has declined, the modern landscape still reflects this historic agricultural use. This history is evident in the form of rectangular fields and stone walls, small residences and buildings like the Benjamin Littlefield Farm (a contributing property to the Corn Neck Road Historic District), and in historic districts like the Mitchell Farm and Corn Neck Road. Crescent Beach was an historic landing site for maritime vessels prior to the establishment of the harbor to the south (RIHPHC, 1991). The first lighthouse at Sandy Point was constructed in 1827 to warn ships away from the dangerous sandbar which forms at the point. The present Block Island North Lighthouse, built in 1867, is the fourth lighthouse on the site. It was known as Sandy Point Light until its name was changed in 1875 (Gibbs, 1974; D'Entremont, 2021). In 1898 a breachway was excavated and the great Salt Pond was made accessible to ships, and a new wharf was subsequently constructed. In the early twentieth century the U.S. Coast Guard station was erected on the south bank of the breachway. Fishing was a major industry until a hurricane decimated the local fleet and wharf structures. Rebuilding efforts were concentrated on the mainland, and consequently fishing never regained its previous scale. In the later twentieth century recreational boating grew in popularity on the Great Salt Pond, resulting in the construction of the existing docks around the pond (RIHPHC, 1991).

Northern New Shoreham is separated from the rest of Block Island by the Great Salt Pond and New Harbor and connected by the narrow Indian Head Neck. The beaches on the north shore are low, rising slightly along the Crescent Beach shoreline as it moves south. The bucolic setting and relatively low vegetation are evocative of a pastoral island community. This portion of Block Island is approximately one mile wide, tapering to a point as one goes north. Due to its narrow width and some areas of slight topographical elevations, views of the ocean are widely available.

3.4.1 Corn Neck Road Historic District

3.4.1.1 Physical Description and Existing Conditions

The Corn Neck Road Historic District is a cultural landscape that encompasses the entire northern tip of Block Island, surrounded by the Atlantic Ocean on three sides and bounded by Mansion Road to the south. The district includes 29 contributing buildings dating back to the eighteenth century, including the NRHP-listed Block Island North Light (74000008). The landscape features bucolic settings, open fields, forested areas, stone walls, and historic farmsteads. It was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.4.2 Indian Head Neck Road Historic District

3.4.2.1 Physical Description and Existing Conditions

The Indian Head Neck Road Historic District is located along a peninsula between Corn Neck Road and great Salt Pond on Block Island. The district consists of five one-and-one-half-story summer cottages with wrap-around porches on large parcels. These cottages were built during the late nineteenth century for seasonal tourists and later for year-round residences. The district has clear views of the ocean and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.4.3 The Hippocampus/Boy's camp/Beane Family

3.4.3.1 Physical Description and Existing Conditions

The Hippocampus/Boy's Camp/Beane Family is an approximately 21.5-acre site located on the south tip of Beane Point. It consists of a large, forested area and three buildings constructed in 1934. It was originally constructed as a recreation and nautical training camp for boys between the ages of 12 and 18 years old. Currently owned by the U.S. Fish and Wildlife Service, the property was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.4.4 The Mitchell Farm Historic District

3.4.4.1 Physical Description and Existing Conditions

The Mitchell Farm Historic District is an historic district located along Corn Neck Road on the narrow isthmus between Great Slat Pond and Rhode Island Sound on Block Island. It includes fifteen contributing properties dating from the mid-eighteenth to the mid-twentieth century. Small, forested areas and open fields are delineated by stone walls. It was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.4.5 The U.S. Lifesaving Station

3.4.5.1 Physical Description and Existing Conditions

The U.S. Lifesaving Station is a one-story building clad in shingles with a gable-and-hip roof, wide bays, and irregular fenestration. The station, built in 1886, was one of 30 such lifesaving stations to be designed by architect Albert Bibb according to a single design plan. The building is situated to take advantage of a scenic view of the Atlantic Ocean to the west (RIHPIC, 1991). The property was determined NRHP-eligible in 1991 (PAL, 2012; PAL, 2013).

3.4.6 The U.S. Coast Guard Brick House

3.4.6.1 Physical Description and Existing Conditions

The U.S. Coast Guard Brick House is a one-story brick 'Officer in Charge' building. It is a part of the U.S. Coast Guard Block Island Station described above and was individually determined NRHP-eligible in 2012 (PAL, 2012; PAL, 2013).

3.4.7 The U.S. Weather Bureau Station

3.4.7.1 Physical Description and Existing Conditions

The U.S. Weather Bureau Station is a two-story Neoclassical-style building set on a brick foundation. The building features a one-story portico supported by pairs of Doric columns, corner pilasters and an entablature. The former U.S. Weather Bureau station was erected in 1903 by the Department of Agriculture according toa design by the firm of Harding and Upman. It served for 46 years as a meteorological observation station before becoming a private residence. It is situated on a hill and commands views overlooking the Old Harbor and the village center to the southeast. It was listed in the NRHP in 1983 (Greenwood, 1983).

3.4.8 The Hygeia House

3.4.8.1 Physical Description and Existing Conditions

The Hygeia House, also known as the Hygeia Annex or the Seaside House, is a 0.76-acre site located on Beach Avenue on Block Island, in New Shoreham, Rhode Island. The property is a two-to-three story, Second Empire-style, wood-frame hotel featuring a mansard roof and a wraparound porch. The hotel is situated on a steep knoll above Trims Pond. It was designed by Francis Wallace and constructed in 1885 and moved to its present location in 1907. It is significant due to its associations with the patterns of Block Island's history as a fashionable seaside resort destination in the late nineteenth century (Dillon, 2000). It was listed in the NRHP in 2001.

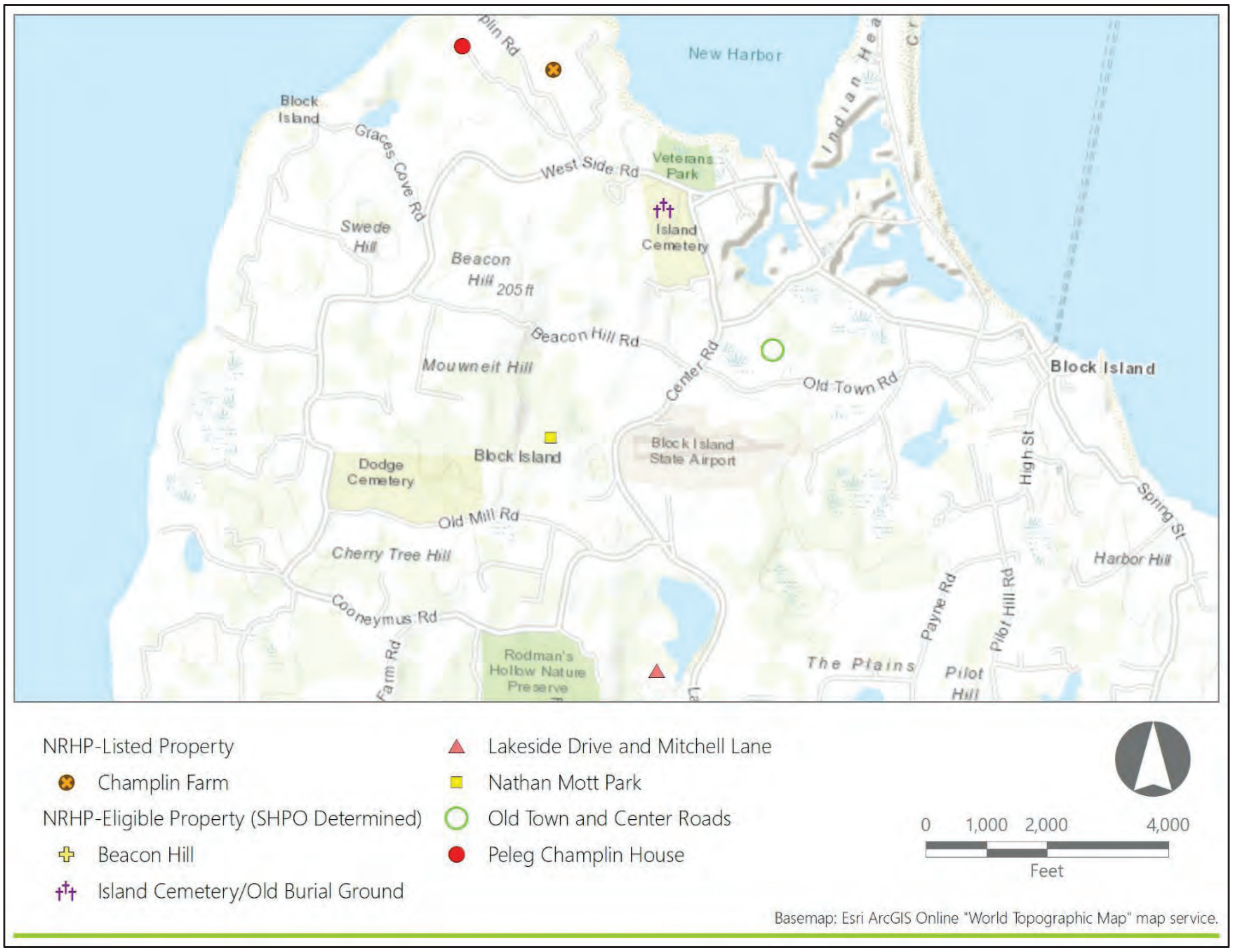
3.4.9 The Beach Avenue Historic District

3.4.9.1 Physical Description and Existing Conditions

The Beach Avenue Historic District is a small, compact neighborhood on a narrow spit separating Trims Pond and Harbor Pond. The district encompasses residential and inn properties built in the late nineteenth to early twentieth centuries. The U.S. Weather Bureau Station and Hygeia House properties, both listed on the NRHP, are contributing resources to the historic district. Well-preserved examples of several architectural styles are included, ranging from Second Empire to Gothic Revival to Neoclassical (PAL, 2012). Although eclectic, the district retains its essential cohesiveness and distinction among the compact developments of Block Island.

3.5 Interior New Shoreham Historic Context and Maritime Setting

Figure 3.5-1. Interior New Shoreham Location Map



For the purposes of this HPTP, Interior New Shoreham is broadly defined as the area south of the Great Salt Pond from Spring and the Old Harbor Historic District in the east to the west coast of Block Island, and southern to Rodman's Hollow. Early settlement by Europeans followed much the same pattern of small agricultural estates spread across the gently rolling topography. Extant early residences like the Peleg Champlin House feature post and beam construction and are clad in shingles and are often found on plots enclosed by fieldstone walls. During the rise of recreational settlement on Block Island in the late nineteenth century, cottage construction likewise increased across the interior of Block Island (RIHPHC, 1991). A subsequent wave of summer cottage construction occurred during the late twentieth century, with much of the work involving the renovation of existing structures, such as the Samuel Ball house, built circa 1680 and substantially rebuilt in 1980 (PAL, 2012).

The maritime atmosphere of the interior of Block Island comes through in its architecture and landscape. The interior of the Island is a rural landscape crossed by meandering roads and long driveways, low stone walls or picket fences, and some forested areas with low trees. The roads are narrow, and in some cases unpaved. The west coast of Block Island consists of low-lying beaches, as opposed to the elevated dunes of the west coast and the bluffs of the south.

3.5.1 The Peleg Champlin House

3.5.1.1 Physical Description and Existing Conditions

The Peleg Champlin House is a one-and-one-half-story gable-roofed residence clad in cedar shingles. The house features a rear wing extension, a central chimney, and rustic detailing throughout the interior. The house is located on a hill overlooking Block Island Sound to the west. Built in circa 1820 by farmer and lifelong Block Island resident Peleg Champlin, the house remained in the family until 1973. The house has a high level of integrity and is significant as an example of vernacular architecture on Block Island from the early nineteenth century. It was listed in the NRHP in 1982 (Greenwood, 1983).

3.5.2 The Lakeside Drive and Mitchell Lane Historic District

3.5.2.1 Physical Description and Existing Conditions

The Lakeside Drive and Mitchell Lane Historic District is an historic district located between Lakeside Drive and Cooneymus Road, just south of the Block Island airport. The district includes Fresh Pond and thirteen contributing buildings. The buildings within the district date from the mid-eighteenth to the mid-twentieth century. The landscape is a significant element of this district, featuring gently rolling topography, stone walls, open fields, and modest homestead which characterize the historic lifeways of Block Island. The district was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.5.3 The Nathan Mott Park

3.5.3.1 Physical Description and Existing Conditions

The Nathan Mott Park is a public park located on approximately 39 acres within the NRHP-eligible Beacon Hill district (PAL.M). The origin of the park dates to the death of Lucretia Mott Ball, who bequeathed 77 acres of farmland in 1941. Subsequent modifications of the boundary reduced the space to its present acreage. The property is significant as the site of the original settlement of Mott's ancestors John and Margaret Rathbun, who established themselves on Block Island in 1661. The park is also representative of conservation and land stewardship on Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.5.4 The Champlin Farm Historic District

3.5.4.1 Physical Description and Existing Conditions

The Champlin Farm Historic District is an historic farmstead located on approximately 16.6 acres of land along Coast Guard Road on Block Island. The farm complex consists of a two- and-one-half-story frame residence, two frame barns, and four sheds. The farm is associated with the Champlin family, who have been farmers on Block Island since the late eighteenth century. The property was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.5.5 The Old Town and Center Roads Historic District

3.5.5.1 Physical Description and Existing Conditions

The Old Town and Center Roads Historic District is an historic district located in the center of Block Island consisting of what was once the original town center, from the west boundary of the Old Harbor Historic District to Center Road. The district includes 48 contributing properties that date from the late-seventeenth to the mid-twentieth century. Historic markers denote the locations of non-extant mills and structures. The oldest structure in the district is the Samuel Ball house, constructed in 1680. The district represents the traditional architecture and development of early Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.5.6 The Beacon Hill Historic District

3.5.6.1 Physical Description and Existing Conditions

The Beacon Hill Historic District is an historic district located west of the Block Island airport from Beacon hill Road to Old Mill Road in the south. It is representative of residential, agricultural, and military development on Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

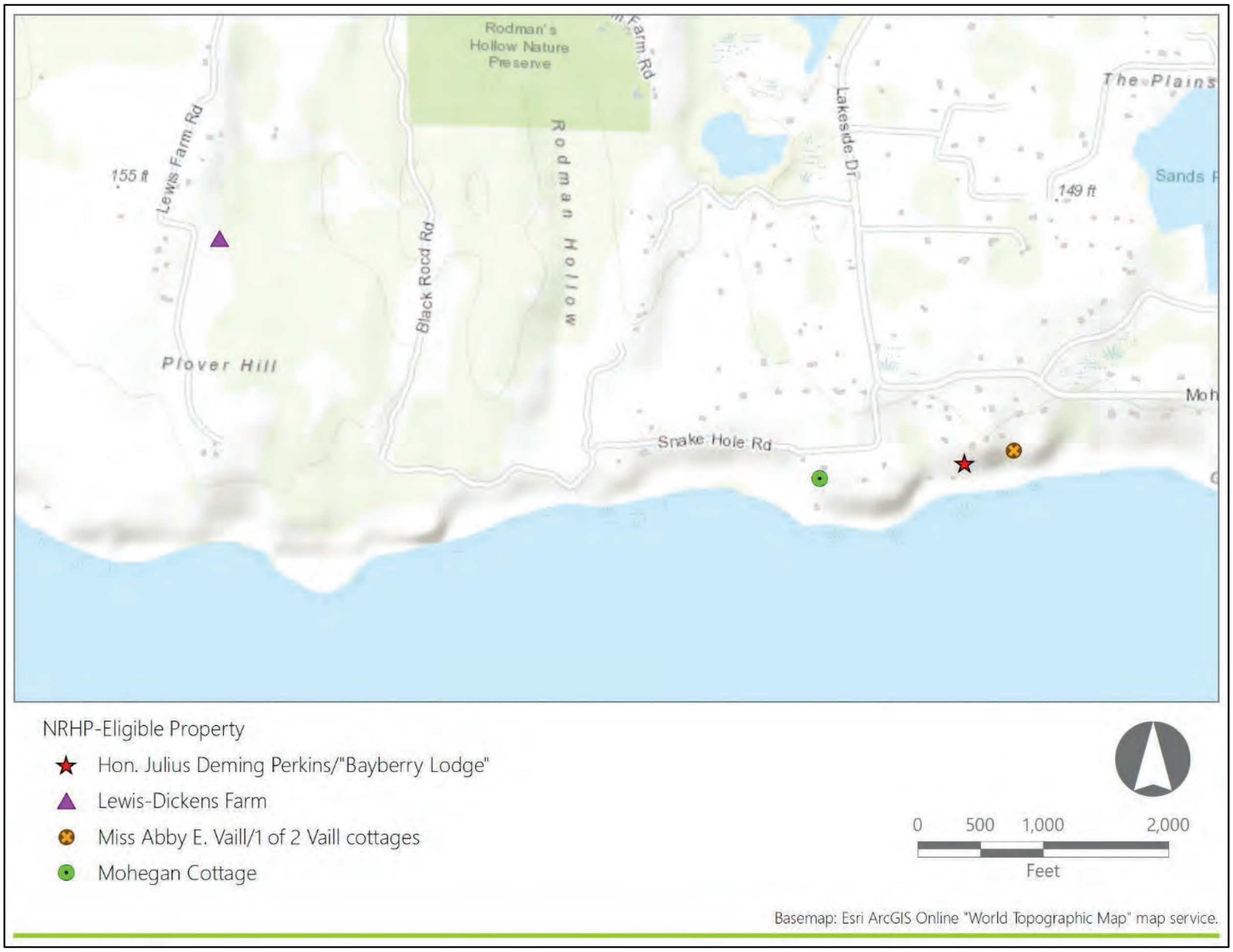
3.5.7 Island Cemetery/Old Burial Ground

3.5.7.1 Physical Description and Existing Conditions

The Island Cemetery/Old Burial Ground is located on a 10.7-acre parcel located at the intersection of West Side and Center Roads (Vision Government Solutions, 2022). The cemetery is located in the northern, interior section of New Shoreham on elevated land. The cemetery is the oldest cemetery on Block Island (Scofield and Adams, 2012).

3.6 Southern New Shoreham/Mohegan Bluffs Historic Context and Maritime Setting

Figure 3.6-1. Southern New Shoreham Location Map



The southern coastline of Block Island was the least developed area over most of its early history after the arrival of Europeans. It was mostly agricultural lands until Dr. Abby E. Vaill purchased 16 acres of land on the south side of Mohegan Trail to establish a sanitorium in 1884, that eventually included several cottages, a hotel and a golf course. Vaill Cottage is the only extant building from Dr. Vaill's original development of a retreat to cater to the health and wellness of late-nineteenth century visitors (Scofield, 2012). Currently the Vaill Cottage (described in Section 3.4.3) is the only building remaining from this period of building development. This portion of Block Island has other extant cottages from this period not associated with the Vaill complex, such as the Mohegan Cottage. While some later residential construction has increased the density along Mohegan Trail, the area to the west of the road is still largely open space, wooded areas, and ponds punctuated by houses overlooking the bluffs.

3.6.1 The Mohegan Cottage

3.6.1.1 Physical Description and Existing Conditions

The Mohegan Cottage, also known as Everett D. Barlow House, is a two-and-one-half-story Queen Anne-style building located on Snake Hole Road. Built in 1886 as a summer home for New York City lawyer Everett D. Barlow, the house was designed by Charles Miller and features Swiss-inspired ornamentation. It was determined eligible for listing on the S/NRHP in 2013 due to its associations with Block Island recreation (PAL, 2012; PAL, 2013).

3.6.2 Lewis-Dickens Farm

3.6.2.1 Physical Description and Existing Conditions

The Lewis Farm and Dickens Farm Road Historic District is an historic agricultural landscape district encompassing most of the southeast corner of Block Island from Cooneymus Road to the Atlantic Ocean. It consists of thirteen contributing properties dating from the mid-eighteenth to the mid-twentieth century. Landscape features such as stone walls and open fields enhance the pastoral setting of the district. It was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.6.3 Vaill Cottage

3.6.3.1 Physical Description and Existing Conditions

The Miss Abby E. Vaill/1 of 2 Vaill Cottages is a one-and-one-half-story cottage set upon an approximately two acres on a bluff overlooking the ocean. It was built in 1885 for New York City physician Abby E. Vaill, as part of a greater recreation complex which included a hotel, additional cottage and a golf course. The 1885 Vaill Cottage is the only extant building from this complex. It was determined to be eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

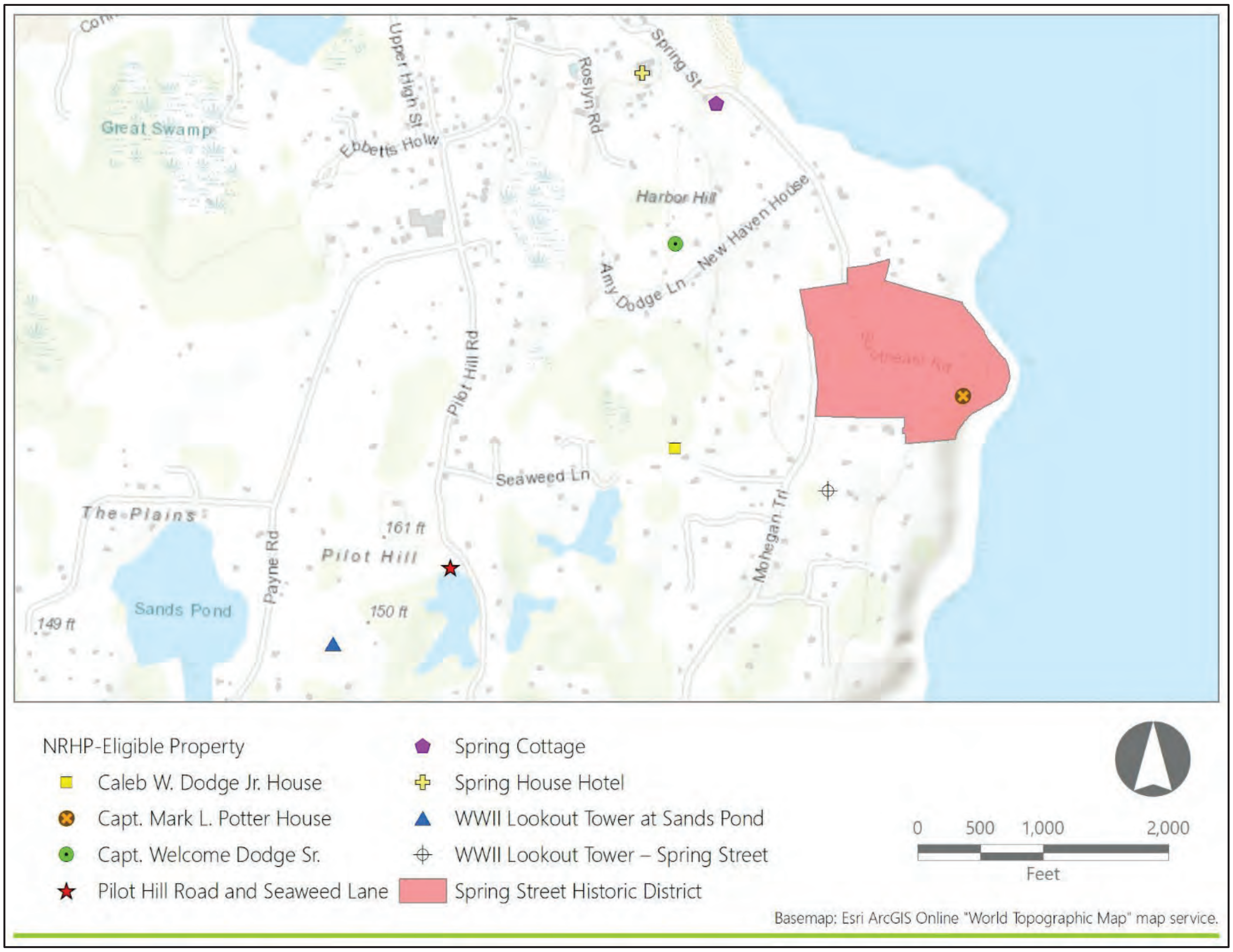
3.6.4 The Hon. Julius Deming Perkins/"Bayberry Lodge"

3.6.4.1 Physical Description and Existing Conditions

The Hon. Julius Deming Perkins/"Bayberry Lodge" is a two-story, Shingle Style frame building built in 1898. It was originally the summer home of Rhode Island State Senator and railroad magnate Julius D. Perkins. It was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7 Southeastern New Shoreham Historic Context and Maritime Setting

Figure 3.7-1. Southeastern New Shoreham Location Map



Southeastern Block Island consists primarily of the seasonal residences and neighborhoods around the outskirts of the Old Harbor Historic District. Seasonal tourism began on Block Island in the early-to-mid nineteenth century. As transportation to the island improved with the first recreational steamboat in 1858, the development of summer beach cottages increased. The construction of the two breakwaters in 1870, accessing the island became easier and raised the number of visitors from throughout New England and New York. Wealthy residents of New York and New England constructed seasonal residences to the south of the Harbor and throughout the Island. Local newspapers ran articles describing some of these new cottages and often reported on the arrival of individual residents. The seasonal residents and the development of their cottages forever changed the landscape, economy, and culture of Block Island.

The setting of this portion of Block Island is picturesque, with the highest concentration of homes overlooking the bluffs below than anywhere else on the island. Houses and hotels built with wraparound porches and ocean views speak to the importance of the sea to the residents. In addition, this seaward-oriented part of Block Island was utilized during World War Two as a forward observation center and included the construction of lookout towers such as those still extant at Sands Pond and Spring Street (see Sections 3.5.9 and 3.5.10, respectively).

3.7.1 Spring Street Historic District

3.7.1.1 Physical Description and Existing Conditions

The Spring Street Historic District is located in the southeastern portion of the Town of New Shoreham, Block Island, and south of the NRHP-listed Old Harbor Historic District. It is roughly bounded by Old Harbor Point Road at the north, the bluffs at the east, properties south of Southeast Road at the south, and Spring Street at the west.

The Spring Street Historic District consists of approximately 14 extant contributing resources dating from the early-nineteenth to the early-twentieth centuries (PAL, 2013). The vernacular cottages are sided in shingles and clapboard, surrounded by large, landscaped lawns, stone walls, and characteristic coastal brush vegetation. These seasonal residences were typically situated to maximize the ocean view from atop the bluffs and are accessed from small dirt roads and driveways off Spring Street. A preliminary list of contributing resources is listed below in Table 3.1-2.

Table 3.7-1. Potential Contributing Resources included in the Spring Street Historic District

Name	Plat	Lot	Approximate Date of Construction
John Wright/Millikin	8	33	1860
Unknown/converted barn	8	35	1875
Capt. Warren A. Ball/Carlotto	8	38	1900
Capt. Warren A. Ball/cottage	8	39	1850
Edward Gideon Ball/Russell Larson	8	42	1850
Capt. Mark L. Potter/"Pine Lodge"/Potter Place/Potter Mansion	8	48	1901
Estate of Newton C. Kimball, Bronx, NY/Kimball Cottage	8	49	1880
Edward J. Faile/Brunberg Cottage	8	50	1928--DEMOLISHED
Capt. Potter Carriage House	8	52	1890
Unknown/not in surveys	8	55	1910
Capt. Nathaniel Dodge	8	62	1876
Charles Greene/Joseph & Monica Hull Shea	8	65	1820
Charles H. Hall/John Steffian	8	66	1860
Unknown/Clarence McClarren/Ernie Howarth/John Handy	8	130	1880
Unknown/not in surveys	8	54	1905

3.7.2 The Caleb W. Dodge Jr. House

3.7.2.1 Physical Description and Existing Conditions

The Caleb W. Dodge Jr. House is a one-and-one-half-story Cape Cod cottage set upon approximately 1.3 acres of land. The cottage was built around 1850, and represents the residential development of Block Island, and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.3 The Capt. Mark L. Potter House

3.7.3.1 Physical Description and Existing Conditions

The Capt. Mark L. Potter House is a two-and-one-half-story four-square home on an approximately 2.45-acre lot overlooking the ocean. It features scalloped shingles and a wrap-around porch with turned columns. The house was built in 1901 as a summer home for Brooklyn shipmaster Captain Mark Potter. It was moved away from the nearby bluffs in the 1970s. This property represents the residential development of Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.4 The Capt. Welcome Dodge Sr. House

3.7.4.1 Physical Description and Existing Conditions

The Capt. Welcome Dodge Sr. House is a one-and-three-quarter-story frame cottage situated in a hollow off of Amy Dodge Lane on Block Island. Captain Welcome Dodge built the house in 1840, and it remained in the family until 1972. This property represents the residential development of Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.5 The Pilot Hill Road and Seaweed Lane Historic District

3.7.5.1 Physical Description and Existing Conditions

The Pilot Hill Road and Seaweed Lane Historic District is an historic district located along Pilot hill Road between Payne Road and Mohegan trail at the southeast corner of Block Island. It includes ten properties that date from the mid-eighteenth to the mid-twentieth century and is also characterized by stone walls and open agricultural fields that give a pastoral setting to the district. The district represents both the residential development and the seasonal tourism of Block Island and was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.6 The Spring House Hotel Cottage

3.7.6.1 Physical Description and Existing Conditions

The Spring House Hotel Cottage is a one-and-one-half-story frame cottage located on an approximately one-acre site. The building features board-and-batten walls and a one-story wrap-around porch. It was originally constructed in 1880 across the road and moved to its present location is 1895. It was determined to be eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.7 The Spring House Hotel

3.7.7.1 Physical Description and Existing Conditions

The Spring House Hotel is a two-and-one-half-story Italianate building built upon an approximately 7.3-acre lot. Built in 1877, the building features a cupola topped with a mansard roof and is wrapped by a bracketed porch. The hotel has remained open for recreational and seasonal visitors since its construction. It is a contributing resource to the Old Harbor Historic District (74000012) and was determined to be individually eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.8 The World War Two Lookout Tower at Sands Pond

3.7.8.1 Physical Description and Existing Conditions

The World War Two Lookout Tower at Sands Pond is a two-story square tower built during World War Two for military observation of Rhode Island Sound. The tower at Sands Pond is attached to a one-and-one-half-story wood-shingled house has been converted into a private residence. This structure was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

3.7.9 The World War Two Lookout Tower at Spring Street

3.7.9.1 Physical Description and Existing Conditions

The World War Two Lookout Tower at Spring Street is a two-story cylindrical tower built during World War two for military observation of Rhode Island Sound. The tower at Spring Street is attached to a one-story wood-shingled structure resembling a cottage. This structure was determined eligible for listing on the NRHP in 2012 (PAL, 2012; PAL, 2013).

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed below. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Development and Implementation of the Coastal Resiliency Plan

4.1.1 Purpose and Intended Outcome

Coastal erosion, threats of severe storms, sea level rise, storm surge, and climate change are constant threats to the historic properties in the Town of New Shoreham. The 2016 *New Shoreham Comprehensive Plan* identifies the need to "increase resiliency of the island to climate change and sea level rise impacts by implementing appropriate adaptation measures" (Town of New Shoreham, 2016). The plan also acknowledges the need to "plan for effects of projected sea level rise and flooding" (Town of New Shoreham, 2016).

Prior to an event of destruction and damage resulting from a natural disaster, public engagement is needed to identify historic preservation priorities and goals, and long-range climate adaption measures that preserve the character and setting associated with historic properties. The purpose of this HPTP is to develop and implement a Coastal Resiliency Plan to protect the coastal historic properties and associated historic settings in New Shoreham. The intended outcome of this HPTP is to develop measures that the Town of New Shoreham and historic property owners can take to ensure the long-term preservation of the physical structures as well as and to maintain the maritime setting of the historic properties located along the coastline of New Shoreham. Public engagement is needed to identify historic preservation priorities and goals, and long-range climate adaption measures that preserve the character and setting associated with historic properties.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Review of existing town planning and hazard mitigation documents and regulations;
- Photography and documentation (e.g. mapping) of existing conditions;
- Public outreach in order to identify historic preservation priorities and concerns;
- Development of a draft Coastal Resiliency Plan incorporating the results of the public outreach which will be submitted to the Participating Parties for review and comment;

- Development of a final plan to be distributed to the Participating Parties; and
- Implementation of priority projects identified in the plan.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services and select a consultant to perform the scope of work listed in Section 4.1.2. The preferred consultants will have experience in developing coastal resiliency plans for historic properties. The consultants will engage the public and Participating Parties to develop a list of prioritized action items to protect and preserve historic properties. The draft and final plans will be developed in consultation with the Participating Parties. The plan will include a list of priority projects including implementation plans, accurate cost estimates, and schedules for completion.

A second RFP will be released to perform the implementation of the priority projects as identified in the plan and determined by the Participating Parties. The chosen professional will document the existing conditions, including photographs, prior to commencing any work and will complete as-built documentation, including photographs at the completion of the project.

4.1.4 Standards

The project will comply with the following standards:

- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68);
- The Secretary of the Interior's Guidance on the Identification of Historic Properties (36 CFR 800.4);
- The Town of New Shoreham Building, Zoning, Land Use & Planning guidance and regulations, as applicable; and
- The Town of New Shoreham Historic District Commission guidance and regulations, as applicable.

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Photographs and documentation of existing conditions.
- Draft plan;
- Final plan; and
- As-built documentation.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

4.2 Town-wide National Register of Historic Places Nomination

4.2.1 Purpose and Intended Outcome

The built environment of the Town of New Shoreham as well as its natural scenic landscape and charm lead to Block Island's development as a summer destination. As transportation to the island improved with the first recreational steamboat in 1858, the development of summer beach cottages increased and with the construction of two breakwaters in 1870, accessing the island became easier and increased the number of visitors from throughout New England and New York. Although many tourists stayed in boarding houses, inns, and hotels, seasonal summer cottages were being constructed in large numbers by the mid-1880s (Scofield, 2012). While there has been new construction and additions to existing buildings over time, the character and feeling of the built environment remains as it did in the past.

The purpose of this mitigation measure is to recognize and document the historic and cultural significance in New Shoreham by completing a NRHP Nomination for the entire Town of New Shoreham. There have been surveys completed to identify historic properties in the Town of New Shoreham, including the *Historic and Architectural Resources of Block Island* in 1991 (RIHPHC, 1991); however, a small portion of the historic properties have been listed on the NRHP. This measure intends to document the eligible historic properties on the island to produce a single nomination.

Listing properties on the NRHP not only documents the history of the area and specific properties but can help build community knowledge and pride. Nomination Forms can be used as educational tools for both the owners of the properties and the community as a whole and can help guide the future restoration and rehabilitation of the buildings. NRHP listing also allows properties to be eligible for state and federal grant funding and historic tax credit programs. NRHP listing does not place any restrictions on a property, nor does it prevent the remodeling or demolition of the building or allow for public access to the building. It does not in any way restrict the rights of the private property owner.

4.2.2 Scope of Work

The scope of work will consist of the following:

- Research of available historic sources and documentation;
- Field survey and conditions assessments;
- Annotated photographs;
- Drafting of the NRHP listing document;
- Submitting the draft for review and comment to the Participating Parties; and
- Developing a final NRHP Nomination to be provided to the Participating Parties.

4.2.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant to perform the scope of work listed in Section 4.2.2. The consultant selected will prepare a draft nomination form, prepared in accordance with applicable NPS and RIHPHC guidance. The draft document will include a historic context and statement of significance, identification, photographs, and descriptions of all contributing resources, and all maps and photographs required by NPS guidance. A final draft will be produced by the consultant that incorporates comments and additional information provided by the Participating Parties. The final document will be presented to the Rhode Island State Historic Preservation Office Review Board.

4.2.4 Standards

The project will comply with the following standards:

- The Secretary of the Interior's Guidance on the *Identification of Historic Properties* (36 CFR 800.4);
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61);
- The National Park Service's (NPS) *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation,* as applicable (NPS, 1997a);
- *National Register Bulletin 16a: How to Complete the National Register Registration Form* (NPS, 1997b); and
- RIHPHC guidance.

4.2.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Preliminary Draft of the NRHP Nomination Form; and
- Revised draft of the NRHP Nomination Form.

4.2.6 Funds and Accounting

It is anticipated that funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[4] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[4] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has

conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Town of New Shoreham Historic Properties, January 27, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 26 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: THE BROWNING'S BEACH HISTORIC DISTRICT, TOWN OF SOUTH KINGSTOWN, WASHINGTON COUNTY, MASSACHUSETTS

[Insert ATTACHMENT 26 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

The Browning's Beach Historic District
Town of South Kingstown, Washington County, Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

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July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding for:	The Browning's Beach Historic District
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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LIST OF ACRONYMS

ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
DEIS	Draft Environmental Impact Statement
EDR	Environmental Design and Research, D.P.C.
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposal
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWF	Revolution Wind Farm
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft, applicant-proposed Historic Property Treatment Plan (HPTP) for Browning's Beach Historic District, which is listed on the National Register of Historic Places (NRHP (hereinafter, the historic property) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic property, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (hereafter, Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
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- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic property discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic property included in this HPTP. Set within its historic context, the applicable NRHP criteria for the historic property is discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic property, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

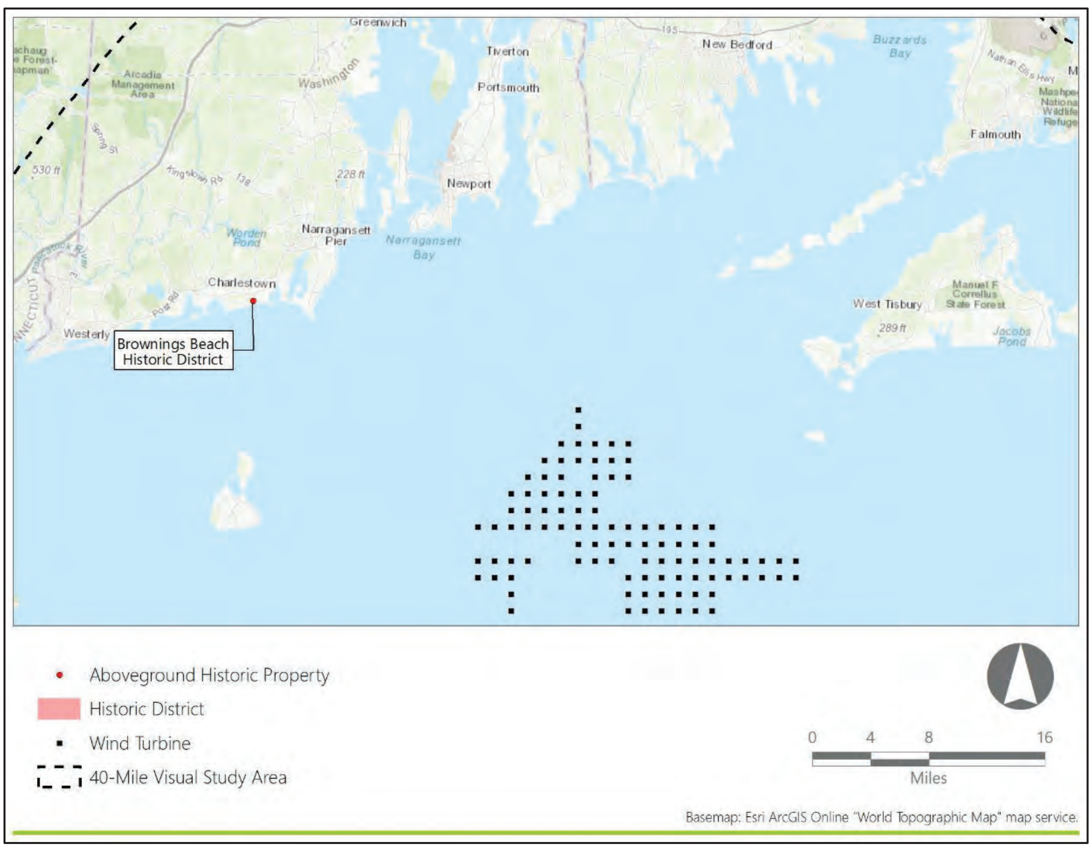
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- The Town of South Kingstown
- The Rhode Island Historical Preservation & Heritage Commission.

Revolution Wind anticipates the above-listed parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

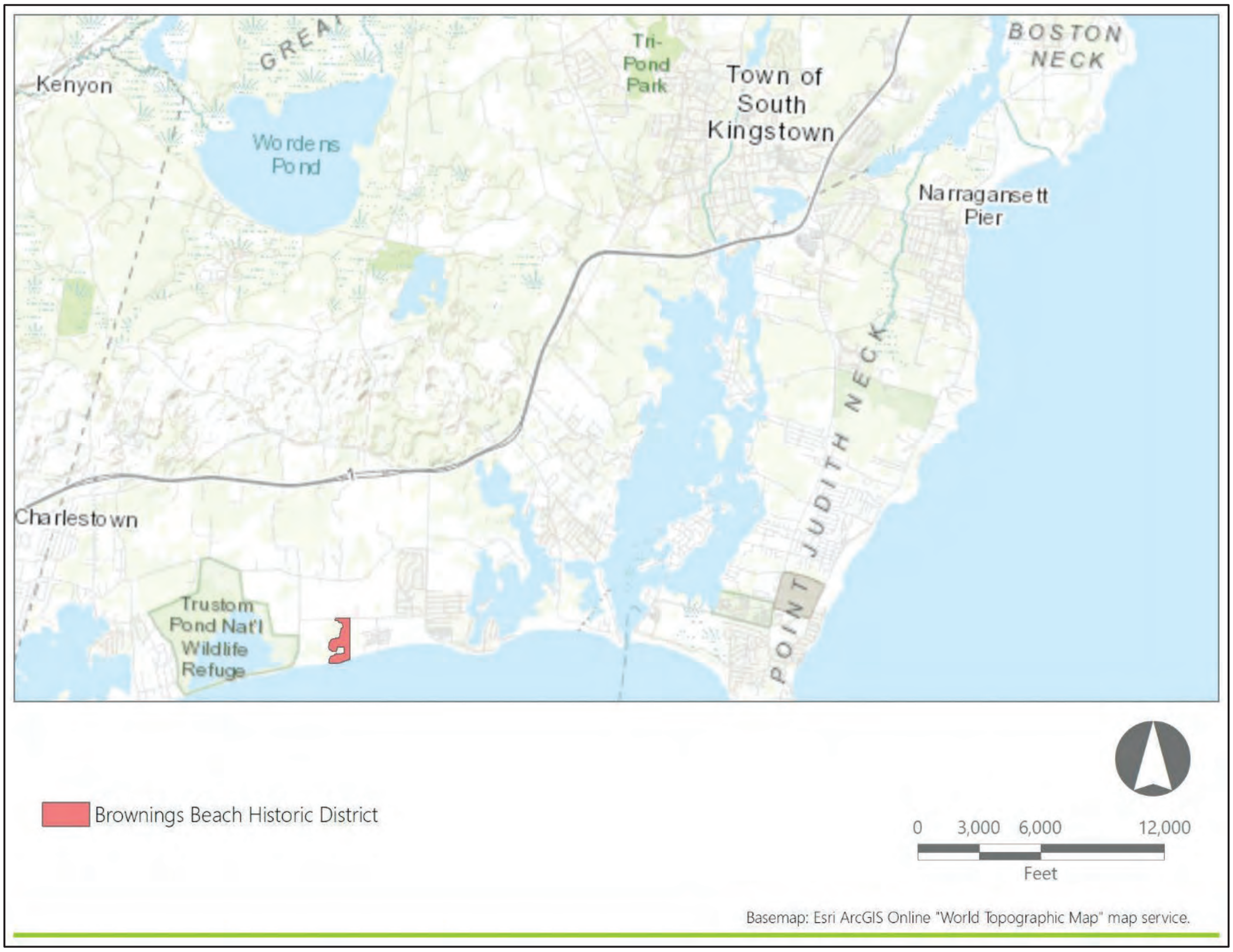
3.1 Historic Properties

This Historic Properties HPTP involves one historic property, as identified in Table 3.1-1 and located on Figure 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Browning's Beach Historic District	NRHP-Listed	South Kingstown	Rhode Island	97000952 (NRHP)	Private	Historic Buildings and Structures

Figure 3.1-1. Historic Property Location



In Section 3.3 the historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this report.

Browning's Beach Historic District is considered within the historic property type defined in the HRVEA as "Historic Buildings and Structures" includes buildings and associated properties historically used as residences (in some instances their current use may be commercial, municipal, institutional, or otherwise non-residential) and is the largest grouping of above-ground historic properties within the PAPE. Historic Buildings and Structures within the PAPE consist mostly of vernacular residences, or groupings of residences, although this above-ground historic property type also includes historic parks and stone markers. The overall character of these individual above-ground historic properties and districts is residential or intended for public enjoyment, as opposed to the grand mansions and summer "cottages" built by wealthy industrialist families that typified the Estates and Estate Complexes property type. These above-ground historic properties are typically listed due to each resource's unique significance or the combined significance of the resources forming an historic district, and usually qualify under National Register Criteria A and C. These factors are shared among the resource to a degree which justifies their grouping as an above-ground historic property type.

Location and orientation of such properties is critical to understanding the nature of any associated maritime settings. Many historic houses were oriented to local roadways, with the front and rear elevations parallel to the nearby road's alignment. Local roadways along the region's shorelines often parallel the water's edge and historic homes frequently shift in orientation along such coastal roads. This variation in orientation may strongly influence the associated views of marine waters that may form important elements of a property's historic setting.

3.3 Browning's Beach Historic District

3.3.1 Physical Description and Existing Conditions

The Browning's Beach Historic District is an NRHP-listed district located in South Kingstown along a private drive extending south of Cards Pond Road (also referred to as Card Ponds Road). The district encompasses approximately 20 acres and includes single family residences constructed in the late nineteenth and early twentieth century as part of a residential complex (Youngken, 1997). The district boundaries stretch south from Cards Pond Road, include a small peninsula extending west into Cards Pond and continues south to the barrier beach facing the Atlantic Ocean.

Review of modern aerial photography reveals that only five of the contributing resources are currently extant, including three buildings on the barrier beach, one building on the peninsula in Cards Pond, and one building on the east side of the private drive between the peninsula and the barrier beach. The buildings appear to have been removed or demolished between 2012 and 2014 (Google Earth, 2022).

3.3.2 Historic Context

The collection of residences constituting the Browning's Beach Historic District were constructed between circa 1895 and circa 1905 as a coastal Rhode Island summer colony, a popular trend at this time throughout coastal Rhode Island. It originated as a private enclave for a group of prominent Rhode Island families including the Knight, Webster, Lapham-Treat, and Noyes families. The complex was designed to take advantage of the recreation offered by the seaside location. There was a communal boardwalk traversing the ocean dunes, a beach cabana which housed changing rooms for bathing, as well as a tennis court, a large stable, shared water system, and shared private drive providing access to the residences (Youngken, 1997).

The district was listed in the NRHP in 1997 and consisted of 10 contributing buildings and one non-contributing building. The contributing buildings consisted of single dwellings representing Queen Anne, Shingle, and Craftsman/Bungalow-style residences constructed between circa 1895 and circa 1905. The district featured wood-framed, one-story to two-and-one-half-story houses. A variety of roofing forms were found in the district, including gabled, gambrel, and gable-on-hip roofs. These houses were typically sheathed in wood shingles, but board-and-batten siding was also present. The private drive providing access to the residences was narrow and graveled (Youngken, 1997).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Browning's Beach Historic District meets NRHP Criterion C as a collection of late-nineteenth and early-twentieth century residences constructed as a summer colony in coastal Rhode Island. The district derives its significance from its maritime location on the coast, representing the significant trend of summer colonies in Rhode Island. The beach provided recreation for the residents, and by extension the view and setting of the Atlantic Ocean is a significant element to the historic district.

4.0 MITIGATION MEASURES

Mitigation measures at the historic property are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Historic Context for Summer Cottage/Resort Development

4.1.1 Purpose and Intended Outcome

As stated above, similarly, to other coastal communities in the region, in the late nineteenth century and through the twentieth century, summer cottages, resorts, and summer colonies began to develop in South Kingstown. These areas were attractive to the upper class for their proximity to Boston and New York and their locations on the water. The rapid rise of local and regional industries, urbanization, and ease of transportation by steam trains and ships in the late nineteenth century was associated with a new leisure class in New England. Scenic coastal enclaves and villages attracted families whose wealth may have been derived from the region's cities, but who sought escape from dense urban centers. Numerous communities developed to cater the recreational and social needs of wealthy families along the shores of Buzzards Bay, Narragansett Bay, and the coastal islands

The purpose of this mitigation measure is to develop a regional context/history of the development of summer cottages, colonies, and resorts on the Rhode Island and Massachusetts coastlines in the late-nineteenth and early-twentieth centuries. The report will include: a brief history of each municipality, focusing on the built environment; an in-depth analysis of the neighborhoods/areas that became summer resorts/colonies; the social and economic impacts of the development; the changes in the built environment of the municipalities; and other related topics.

The intent of this report is to document this important movement in New England history, which changed the cultural, economic, and landscape of Rhode Island and Massachusetts. The report will be completed in coordination with all relevant stakeholders and the final report will be distributed to the municipalities and SHPOs.

4.1.2 Scope of Work

The scope of work will consist of the following:

- Conduct archival research;

- Identify and consult with relevant stakeholders and the Participating Parties;
- Develop a draft report to be distributed to the Participating Parties for review and comment; and
- Develop a final report, addressing the comments received, to be distributed to the Participating Parties.

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work and select a consultant to perform the scope of work listed in Section 4.1.2. The consultant should have a demonstrated knowledge and experience in developing historic contexts focusing on changes in the social, economic, and built environment and a knowledge of the history of New England. A draft of the report will be distributed to the Participating Parties for review and comment. A final report will be produced by the consultant that incorporates any comments and additional information provided by the Participating Parties and will be distributed to the Participating Parties.

4.1.4 Standards

The exhibit will conform to the following standards:

- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable;
- RIHPHC guidance;
- MHC guidance;

4.1.5 Documentation

The following documentation is to be provided for review by Participating Parties:

- Request for Proposals (RFP);
- Proposals by qualified consultants in response to the RFP;
- Preliminary draft report; and
- Final report.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[2] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

[2] The timeline is subject to change and is based on current available information.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic property. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Rhode Island Historic Properties, February 3, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

6.0 REFERENCES

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ATTACHMENT 27 – HISTORIC PROPERTIES TREATMENT PLAN FOR THE REVOLUTION WIND FARM: EIGHT HISTORIC LIGHTHOUSES, MASSACHUSETTS AND RHODE ISLAND

[Insert ATTACHMENT 27 – TREATMENT PLAN ABOVE-GROUND HISTORIC PROPERTIES THAT WILL BE VISUALLY ADVERSELY AFFECTED]

Applicant-Proposed Draft – Subject to Review by BOEM and Consulting Parties

Draft Historic Property Treatment Plan

for the

Revolution Wind Farm

Eight Historic Lighthouses

Massachusetts and Rhode Island

Submitted to:

Bureau of Ocean Energy Management
U.S. Department of the Interior

Prepared for:

Revolution Wind, LLC
https://revolutionwind.com/

Prepared by:

Environmental Design & Research, D.P.C.
217 Montgomery Street, Suite 1100
Syracuse, New York 13202
www.edrdpc.com

July 2022

ABSTRACT

Federal Undertaking:	Revolution Wind Farm and Revolution Wind Export Cable Project
Location:	Outer Continental Shelf and Rhode Island
Federal and State Agencies:	Bureau of Ocean Energy Management National Park Service U.S. Army Corps of Engineers Massachusetts Historical Commission Rhode Island Historical Preservation & Heritage Commission New York Historic Preservation Office Connecticut Historic Preservation Office Advisory Council on Historic Preservation
Regulatory Process:	National Environmental Policy Act Section 106 of the National Historic Preservation Act Section 110(f) of the National Historic Preservation Act
Purpose:	This draft, applicant-proposed Historic Property Treatment Plan provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated November 2021 for the Revolution Wind Project.
Potential Adverse Visual Effect Finding For:	The Sakonnet Light Station, Little Compton, Newport County, RI The Block Island North Lighthouse, New Shoreham, Washington County, RI The Point Judith Lighthouse, Narragansett, Washington County, RI The Beavertail Light, Jamestown, Newport County, RI The Tarpaulin Cove Light, Gosnold, Dukes County, MA The Clark's Point Light, New Bedford, Bristol County, MA The Butler Flats Light Station, New Bedford, Bristol County, MA The Nobska Point Lighthouse, Falmouth, Barnstable County, MA
Submitted By:	Revolution Wind, LLC
Date:	July 2022

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ACHP	Advisory Council on Historic Preservation
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations

COP	Construction and Operations Plan
EDR	Environmental Design and Research, D.P.C.
DEIS	Draft Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FR	Federal Register
HPTP	Historic Property Treatment Plan
MHC	Massachusetts Historical Commission
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NPS	National Park Service
NRHP	National Register of Historic Places
RFP	Request for Proposals
RIHPHC	Rhode Island Historical Preservation & Heritage Commission
ROD	Record of Decision
RWEC	Revolution Wind Export Cable
RWF	Revolution Wind Farm
SOI	Secretary of the Interior
USCG	United States Coast Guard
WTG	Wind Turbine Generator

1.0 EXECUTIVE SUMMARY

This draft applicant-proposed Historic Property Treatment Plan (HPTP) for the Sakonnet Light Station, the Block Island North Lighthouse, the Point Judith Lighthouse, the Beavertail Light, the Tarpaulin Cove Light, the Clark's Point Light, the Butler Flats Light Station, and the Nobska Point Lighthouse, all of which are listed on the National Register of Historic Places (the historic properties) provides background data, historic property information, and detailed steps that will be implemented to carry out mitigation actions to resolve potential adverse effects preliminarily identified by the applicant in the *Historic Resources Visual Effects Analysis – Revolution Wind Farm*, dated July 2022 (HRVEA; EDR, 2022) for the Revolution Wind Farm (RWF) and Revolution Wind Export Cable Project (collectively, the Undertaking). Revolution Wind LLC (Revolution Wind) is providing this draft HPTP prior to the Bureau of Ocean Energy Management (BOEM) making findings of adverse effect for the Undertaking under the National Historic Preservation Act of 1966 (NHPA), and finalization of this draft HPTP remains subject to BOEM's final finding of adverse effect for the historic properties.

BOEM will use the National Environmental Policy Act (NEPA) substitution process to fulfill its Section 106 obligations as provided for in the NHPA implementing regulations (36 CFR § 800.8(c)), and BOEM has notified the Advisory Council on Historic Preservation (ACHP), State Historic Preservation Officers, and consulting parties of BOEM's decision to use this process. Revolution Wind has provided this draft HPTP to BOEM for inclusion in the Draft Environmental Impact Statement (DEIS) for review by consulting parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. This draft HPTP describes the applicant-proposed mitigation measures to resolve potential adverse effects on historic properties and proposes the implementation steps and timeline for actions. The mitigation measures are based on the evaluations and outreach performed by Revolution Wind prior to the issuance of the DEIS. Revolution Wind anticipates the HPTP documents will undergo revision and refinement in consultation with the Massachusetts State Historic Preservation Officer, the Rhode Island State Historic Preservation Officer, the ACHP, and/or other consulting parties throughout the NEPA substitution process. If BOEM makes a finding of adverse effect for the historic properties, it is anticipated that the mitigation measures described herein (and further refined through consultation with applicable parties) will be included in the Record of Decision (ROD) and/or Memorandum of Agreement (MOA) issued in accordance with 40 CFR parts 1500-1508, and 36 CFR §§ 800.8, 800.10.

The timeline for implementation of the mitigation measures will be determined in consultation with parties that demonstrated interest in the affected historic properties (the Participating Parties) based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[1] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).

[1] The timeline is subject to change and is based on current available information.

- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
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- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

This draft HPTP is organized into the following sections:

- **Section 1.0, Introduction**, outlines the content of this HPTP.

- **Section 2.0, Cultural Resources Regulatory Context**, briefly summarizes the Undertaking while focusing on cultural resources regulatory contexts (federal, tribal, state, and local, including preservation restrictions), identifies the historic properties discussed in this HPTP that will be adversely affected by the Undertaking, and summarizes the pertinent provisions and attachments of the HRVEA (EDR, 2022) and *Revolution Wind Farm Construction and Operations Plan* (COP; Revolution Wind, 2021) that guided the development of this document.

- **Section 3.0, Existing Conditions, Historic Significance, and Maritime Setting**, provides a physical description of the historic properties included in this HPTP. Set within its historic context, the applicable National Register of Historic Places (NRHP) criteria for the historic properties are discussed with a focus on the contribution of a maritime visual setting to its significance and integrity.

- **Section 4.0, Mitigation Measures**, presents specific steps to carry out the applicant-proposed mitigation actions identified in the COP or alternative measures developed through stakeholder engagement meetings to date. The mitigation action includes a detailed description, intended outcome, methods, standards, and requirements for documentation. The mitigation action details may be revised, based on feedback gathered during the process.

- **Section 5.0, Implementation**, establishes the process for executing mitigation actions at the historic properties, as identified in Section 4.0 of this HPTP. For each/the action, organizational responsibilities are outlined, a timeline is provided, and regulatory reviews are listed.

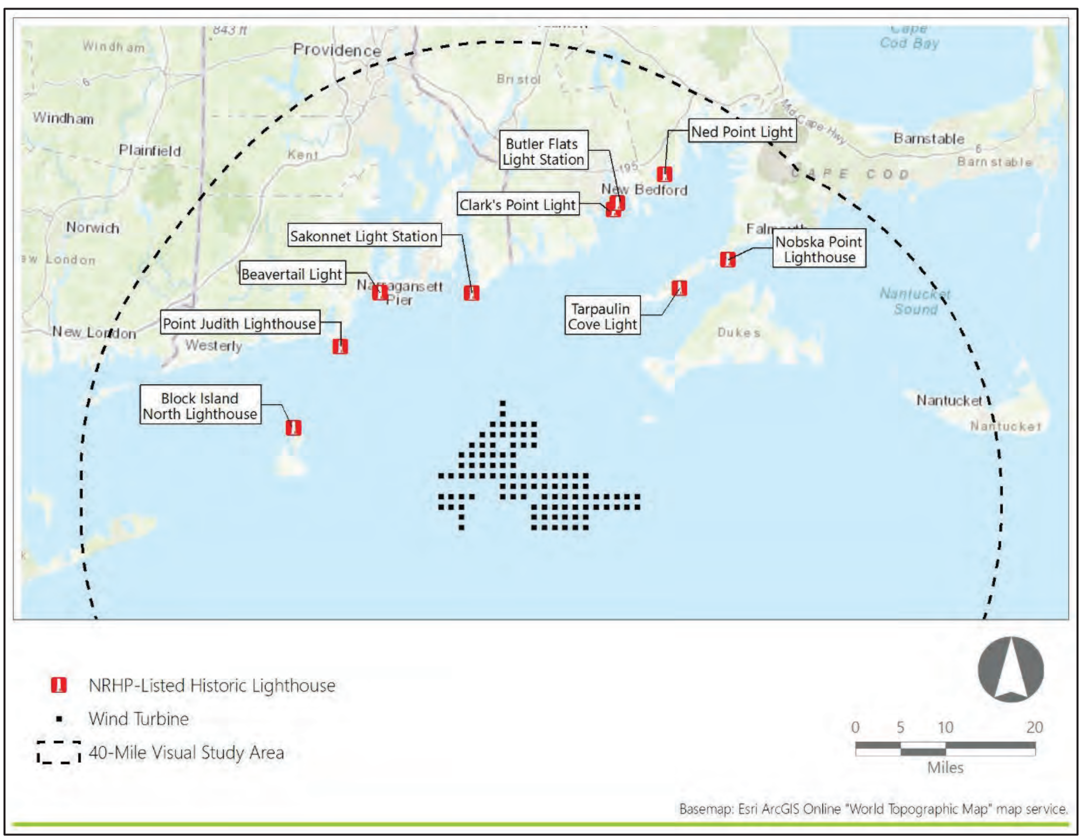
- **Section 6.0, References**, is a list of works cited in this HPTP.

2.0 BACKGROUND INFORMATION

2.1 Project Overview: Revolution Wind Farm and Revolution Wind Export Cable

The Undertaking is a wind-powered electric generating facility composed of up to 100 wind turbine generators (WTGs) and associated foundations, two offshore substations, and inter-array cables connecting the WTGs and the offshore substations (see Figure 2.1-1). The WTGs, offshore substations, array cables, and substation interconnector cables would be located on the Outer Continental Shelf approximately 15 nautical miles (18 statute miles) southeast of Point Judith, Rhode Island, approximately 13 nautical miles (15 statute miles) east of Block Island, Rhode Island, approximately 7.5 nautical miles (8.5 statute miles) south of Nomans Land Island National Wildlife Refuge (uninhabited island), and between approximately 10 to 12.5 nautical miles (12 to 14 statute miles) south/southwest of varying points of the Rhode Island and Massachusetts coastlines (62 FR 33708). In addition, two submarine export cables located in both federal waters and Rhode Island State territorial waters, will connect the offshore substation to the electrical grid. The proposed interconnection location for the Undertaking is the existing Davisville Substation, which is owned and operated by The Narragansett Electric Company d/b/a National Grid and located in North Kingstown, Rhode Island. The visible offshore components of the operational Undertaking will be located on Lease OCS-A 0486 in water depths ranging from approximately 108 to 125 feet.

Figure 2.1-1. Project Location



2.2 Section 106 and Section 110(f) of the National Historic Preservation Act (NHPA)

The regulations at 36 CFR § 800.8 provide for use of the NEPA process to fulfill a federal agency's NHPA Section 106 review obligations in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6. Under these provisions, issuance of an ROD and implementation of relevant conditions will resolve adverse effects to historic properties caused by the Undertaking, including to National Historic Landmarks for which BOEM must provide a higher standard of care, as required by Section 110(f) of the NHPA.

The measures to avoid and minimize adverse effects to identified historic properties are described in the COP (Section 4.4.1.3 and Appendix BB). This HPTP describes the applicant-proposed treatment plans to resolve the remaining adverse effects after application of the above-referenced measures. The mitigation measures reflect a refinement of the conceptual mitigation framework proposed by Revolution Wind (see Appendix BB in the COP).

All activities implemented under this HPTP will be conducted in accordance with any conditions imposed by BOEM in its ROD and with applicable local, state and federal regulations and permitting requirements. Responsibilities for specific compliance actions are described in further detail in Section 5.2, Organizational Responsibilities.

2.2.1 Municipal Regulations

Before implementation, any on-site mitigation measures will be coordinated with local municipalities and commissions to obtain approvals, as appropriate. These may include, but are not limited to building permits, zoning, land use, planning, historic commissions, and design review boards. Additional information regarding compliance with local requirements appears in Section 5.0, Implementation.

2.2.2 Preservation Easements and Restrictions

Preservation easements and restrictions protect significant historic, archaeological, or cultural resources. The State of Massachusetts preservation restrictions are outlined in Massachusetts General Law Chapter 184, Sections 31-33 and Rhode Island General Law Title 42, Section 42-45-9.1 established a historic preservation easement fund. Any mitigation work associated with the Historic Properties will comply with the conditions of all extant historic preservation easements (see Table 2.2.2-1). Additional information regarding compliance with extant preservation restrictions appears in Section 5.0, Implementation.

Table 2.2.2-1. Restrictions at the Historic Properties

Restriction	Legislation	Agency
Sakonnet Light Station – Historic Preservation	Rhode Island General Law Title 42, Section 42-45-9.1	RIHPHC
Block Island North Light – Historic Preservation	Rhode Island General Law Title 42, Section 42-45-9.1	RIHPHC
Block Island North Light – Aid to Navigation	10 USC 2668 Easements for Rights of Way	USCG

Restriction	Legislation	Agency
Beavertail Light – Historic Preservation	Rhode Island General Law Title 42, Section 42-45-9.1	RIHPHC
Clark's Point Light – Historic Preservation	Massachusetts General Law Chapter 184, Sections 31-33	MHC
Butler Flats Light Station – Aid to Navigation	10 USC 2668 Easements for Rights of Way	USCG
Nobska Point Lighthouse – Aid to Navigation	10 USC 2668 Easements for Rights of Way	USCG

2.3 Participating Parties

BOEM initiated consultation under Section 106 with invitations to consulting parties on April 30, 2021. BOEM hosted the first Section 106-specific meeting with consulting parties on December 17, 2021, and Revolution Wind anticipates that BOEM will hold additional meetings pursuant to Sections 106 and 110(f) of the NHPA and in accordance with 36 CFR 800.8.

Following BOEM initial Section 106 meeting with consulting parties, Revolution Wind held stakeholder outreach meetings (see Section 5.3) to review conceptual mitigation measures for the historic property and invited the following parties:

- Block Island Historical Society
- U.S. Coast Guard
- Martha's Vineyard Commission
- Town of Narragansett
- Town of Jamestown
- Town of Little Compton
- City of New Bedford
- Beavertail Lighthouse Museum Association
- Trustees of Reservations
- Town of Gosnold
- Cuttyhunk Historical Society
- Town of Barrington
- Friends of Sakonnet Light
- Lighthouse Preservation Society
- The Rhode Island Historical Preservation & Heritage Commission
- The Massachusetts Historical Commission.[2]

Revolution Wind anticipates these parties and any subsequently identified parties will participate in the finalization of this HPTP through BOEM's Section 106 consultation process.

[2] MHC was invited to attend stakeholder outreach meetings regarding historic properties in Massachusetts; however, MHC has not participated in outreach meetings for Revolution Wind.

3.0 EXISTING CONDITIONS, HISTORIC SIGNIFICANCE, AND MARITIME SETTING

3.1 Historic Properties

This HPTP involves 12 historic properties, as identified in Table 3.1-1.

Table 3.1-1. Historic Properties included in the HPTP

Name	Property Designation	Municipality	State	Site No. (Agency)	Ownership	Historic Property Type
Nobska Point Lighthouse	NRHP-Listed	Falmouth	MA	87001483 (NPS) FAL.LH (MHC)	Private	Lighthouses and Navigational Aids
Sakonnet Light Station	NRHP-Listed	Little Compton	RI	83000179 (NPS)	Private	
Block Island North Lighthouse	NRHP-Listed	New Shoreham	RI	74000008 (NPS)	Public – Municipal	
Point Judith Lighthouse	NRHP-Listed	Narragansett	RI	88000279 (NPS)	Public – USCG	
Beavertail Light	NRHP-Listed	Jamestown	RI	77000024 (NPS)	Public – USCG	
Tarpaulin Cove Light	NRHP-Listed	Gosnold	MA	87001505 (NPS) GOS.900 (MHC)	Public – USCG	
Clark's Point Light	NRHP-Listed	New Bedford	MA	82005273 (NPS) NBE.909 (MHC)	Public – Municipal	
Butler Flats Light Station	NRHP-Listed	New Bedford	MA	87001530 (NPS) NBE.908 (MHC)	Public – Municipal	

In Sections 3.3 through 3.10, each historic property is described both physically and within its historic context, with a focus on the contribution of a maritime visual setting to the property's significance and integrity.

3.2 Maritime Setting

For the purposes of this analysis and assessment, views of marine waters are considered critical aspects of maritime settings. The influence of the marine environment and related human activities on historical development patterns is extensive and may be expressed in areas without direct lines of sight to the sea. Although these types of setting may contribute to the significance of historic properties, they would not be subject to alteration as a result of the proposed undertaking and are not considered further in this plan.

The historic properties included in this HPTP are all considered within the historic property type defined in the HRVEA as "Lighthouses and Navigational Aids" which is defined by the historic associations with water-related transportation and defense, prominent views of the sea and dominance of the surrounding landscape, and common architectural forms. These structures present themselves as prominent and iconic features on the coastal landscape, possess elevated views of the ocean horizon, and are sited specifically for those elevated views.

Lighthouses and other historic navigation aids in the study area include properties that were intended to serve mariners plying large areas of open water and other properties that served specific navigation routes through the complex and treacherous waters of the region's bays. All of these properties have an obvious association with maritime settings, but the scale of those settings will vary due to the conformation of the local landscape and seas and the design and purpose of each navigation aid.

3.3 The Sakonnet Light Station

3.3.1 Physical Description and Existing Conditions

The Sakonnet Light Station is an approximately 66-foot-tall "sparkplug" type lighthouse located upon Little Cormorant Rock, a rock outcrop off Sakonnet Point in Little Compton, Rhode Island. The lighthouse tower is constructed of brick with a cast iron exterior wall and sits atop a brick and concrete caisson. The caisson is painted black while the cast iron tower and lantern are painted white. Tower fenestration includes double-hung windows with cast iron pediments at the three lower levels and porthole windows at the uppermost level (Jones, 1982).

3.3.2 Historic Context

Funding to construct the Sakonnet Light Station was approved by Congress in 1882. The lighthouse was built between 1883 and 1884 and was the first aid to navigation along a long stretch of previously unlit coastline. The lighthouse is one of many prefabricated cast iron towers built during a nationwide boom in lighthouse construction between 1850 and 1910. The Sakonnet Light Station was staffed by a keeper and an assistant keeper (in later years, two assistants) who resided in the tower (Jones, 1982; D'Entremont, 2021a).

The lighthouse was significantly damaged by the Great New England Hurricane of 1938. After it was damaged again in Hurricane Carol in 1954, it was decommissioned by the United States Coast Guard (USCG). Following several years of abandonment, it was purchased in 1961 by Carl Haffenreffer, listed in the NRHP in 1983, and donated to Sakonnet Point Lighthouse, Inc. in 1985. The lighthouse was subsequently restored and was finally relighted in 1997. Another substantial restoration took place between 2010 and 2012 (D'Entremont, 2021a).

3.3.3 NRHP Criteria and the Maritime Visual Setting

The Sakonnet Light Station meets NRHP Criteria A and C for its association with the history of commerce and transportation in Rhode Island and as an example of nineteenth-century lighthouse engineering and prefabrication. According to Jones (1982), Sakonnet Light is a representative example of the standardized, prefabricated cast-iron tower that “played a pivotal role in the evolution of the country’s lighthouse system, and is a notable survivor from the system’s era of greatest growth.” The lighthouse retains a high degree of integrity of feeling and setting in its dramatic site atop a rock outcrop roughly 2,500 feet from the mainland.

The Sakonnet Light Station was constructed to identify the mouth of the Sakonnet River “as a refuge for coasting vessels during storms, and servicing as an aid to navigation along a long, then-unlighted stretch of coastline” (Jones, 1982). As stated above, the Sakonnet Light Station was damaged by hurricanes in 1938 and 1954 and remained unlit and inactive for over forty years. While historically, the light was an indicator directing vessels to a safe location to wait out storms, today the light can be seen from approximately seven nautical miles. The maritime setting of the Sakonnet Light Station is inextricably linked to its historic and current use and historic significance.

3.4 The Block Island North Lighthouse

3.4.1 Physical Description and Existing Conditions

The Block Island North Lighthouse is located on Sandy Point, Block Island, within the Block Island National Wildlife Refuge. The lighthouse is comprised of a two-and-one-half-story granite residence with a gable roof and a single-story wing. The main roof is surmounted by a chamfered square iron tower and cast-iron lantern over the primary elevation. The building has Italianate style segmental arch hood moldings and pedimented entrances (Gibbs, 1974).

3.4.2 Historic Context

The first lighthouse at Sandy Point was constructed in 1827 to warn ships away from the dangerous sandbar which forms at the point. The present Block Island North Lighthouse, built in 1867, is the fourth lighthouse on the site. It was known as Sandy Point Light until its name was changed in 1875 (Gibbs, 1974; D’Entremont, 2021b).

The Block Island North Lighthouse was automated in 1956. It was deactivated in 1973 and listed in the NRHP the following year. The site was subsequently acquired by the United States Fish and Wildlife Service, which transferred the lighthouse and a 2-acre parcel to the Town of New Shoreham in 1984. The lighthouse was returned to service in 1989, and the first floor of the lighthouse opened as a museum in 1993, with the original Fresnel lens on display. The tower and lantern underwent a substantial restoration in 2009 (D’Entremont, 2021b).

3.4.3 NRHP Criteria and the Maritime Visual Setting

The Block Island North Lighthouse meets NRHP Criteria A and C for its association with the history of commerce and transportation in Rhode Island, and as an example of mid-nineteenth century architecture and lighthouse engineering. The lighthouse retains a remarkable degree of integrity of feeling and setting due to the preservation of its original roughly 30-acre site as a wildlife refuge.

According to the NRHP Nomination Form when Block Island North Lighthouse was constructed it was visible for thirteen and a half miles and had a fixed white light. The light marked the entrance to both Block Island and Long Island Sounds and provided guidance to vessels to avoid the sand bar located off Sandy Point. (Gibbs, 1974). The location and function of Block Island North Lighthouse as aid to navigation both locally around Sandy Point and more regionally as an entrance to Block Island and Long Island Sounds are important aspects of its significance.

3.5 The Point Judith Lighthouse

3.5.1 Physical Description and Existing Conditions

The Point Judith Lighthouse is located at 1470 Ocean Road in Narragansett, Rhode Island, within the approximately 4.8-acre USCG Station Point Judith. The lighthouse is a 51-foot-tall octagonal battered granite tower with a cast iron lantern. Fenestration consists of one window each at the first, third, fourth, and fifth floor levels. The entrance is via a simple arched doorway. The daymark consists of the unpainted dark brown upper half contrasting with the lower half which is painted white. A small single-story gable-roofed oil house (1917) stands southeast of the lighthouse and a single-story hip-roofed brick fog signal building (1923) is located to the southwest (York, 1987).

3.5.2 Historic Context

The first lighthouse at Point Judith was constructed in 1810. The current Point Judith Lighthouse, the third on the site, was completed in 1857, and originally included a brick keeper’s residence connected to the lighthouse via a covered walkway. A fog signal, added in 1867, was converted to a steam whistle in 1872, and an assistant keeper’s dwelling was added in 1874. In 1931, the first radio beacon at a Rhode Island lighthouse was put into service at Point Judith. Both the keeper’s and assistant keeper’s dwellings were demolished in the mid-twentieth century. A U.S. Life-Saving Station established just east of the lighthouse in 1876 became Point Judith Coast Guard Station in 1915. It was administered separately from the lighthouse until 1939 when the USCG assumed responsibility for the nation’s aids to navigation. The lighthouse was automated in 1954 and continues to be maintained by the USCG (York, 1987).

3.5.3 NRHP Criteria and the Maritime Visual Setting

The Point Judith Lighthouse meets NRHP Criteria A and C for its association with the history of commerce and transportation in Rhode Island, for its role in the technological development of aids to navigation, and as an example of mid-nineteenth century lighthouse engineering.

While the existing lighthouse was constructed in 1867, a Point Judith Lighthouse has served as an active lighthouse guiding vessels along the coast of Rhode Island since the first structure was built in 1810. The lighthouse was constructed to guide vessels traveling between New York and New England around the rough, rocky coastline of Narragansett, an area also very prone to dense fog (D'Entremont, 2021f). The maritime setting on an exposed peninsula is inextricably linked to the Point Judith Lighthouse's historic use and significance.

3.6 The Beavertail Light

3.6.1 Physical Description and Existing Conditions

The Beavertail Light is located at the southern tip of Conanicut Island at the mouth of Narragansett Bay. The lighthouse is an approximately 45-foot-tall square-plan granite tower with a cast iron lantern. The tower's stone construction, consisting of alternating rows of long and short stone units resulting in a quoin effect at the corners, is unique among New England lighthouses. The tower is connected to a two-story hip-roofed keeper's house. An assistant keeper's house and signal house are also located on the site, along with several additional support buildings (Jones, 1977).

3.6.2 Historic Context

Beavertail Point has been the location of lighthouses and beacons since the early eighteenth century. The first lighthouse at Beavertail Point (the third constructed in the American colonies) was a wood structure completed in 1749. Its replacement was burned by British forces in 1779; it was repaired and continued in service until the present lighthouse and keeper's house were built in 1856. An assistant keeper's house was added in 1898 and many additional ancillary structures were built in the ensuing decades (Jones, 1977).

The second and third lighthouses at Beavertail Point were the site of technological advances in navigational aid technology in the nineteenth century. An early experiment with gas illumination took place in 1817-1818, and from about 1857 to 1881, a succession of first-of-their-kind trumpets and whistles were installed. The light was electrified in 1931 and automated in 1972 (Jones, 1977).

3.6.3 NRHP Criteria and the Maritime Visual Setting

The Beavertail Light meets NRHP Criteria A and C for its association with the history of commerce and transportation in Rhode Island, for its role in the technological development of aids to navigation, and as a unique example of mid-nineteenth-century lighthouse engineering.

The Beavertail Light is located at the southern tip of Conanicut Island in Jamestown between the east and west passages of Narragansett Bay. Beavertail Point consists of rocky outcroppings and the lighthouse was strategically located to warn vessels of the dangerous conditions (Jones, 1977). In 1838 the light was visible for 15.75 nautical miles (D'Entremont, 2021g). The maritime setting on an exposed peninsula is inextricably linked to the Beavertail Light's historic use and significance.

3.7 The Tarpaulin Cove Light

3.7.1 Physical Description and Existing Conditions

The Tarpaulin Cove Light is located on the largely undeveloped Naushon Island, in a grassy meadow surrounded by a stone wall. The lighthouse consists of a 38-foot-tall cylindrical brick tower with a cast iron lantern and gable-roofed brick entry house atop a concrete foundation. The tower and entry house are painted white, and all windows have been infilled (Tait et al., 1986).

3.7.2 Historic Context

The first lighthouse at Tarpaulin Cove was established in 1817 along what was then one of the busiest shipping channels in the world. Tarpaulin Cove was historically used as a refuge during storms and by ships awaiting favorable winds as they traveled in and out of Vineyard Sound. The current lighthouse was built in 1856 and remodeled in 1891. The fog bell was destroyed in the hurricane of 1938 and the light was automated in 1941. The wood frame keeper's house (1888) and other ancillary structures were demolished in 1962. The lighthouse is owned by the USCG and maintained by the Cuttyhunk Historical Society (Tait et. Al., 1986; D'Entremont, 2021c). Naushon Island was purchased by the Forbes family in the 1840s and remains under family trust ownership today.

3.7.3 NRHP Criteria and the Maritime Visual Setting

The Tarpaulin Cove Light meets NRHP Criteria A and C for its association with the history of commerce and transportation in Massachusetts and as an example of mid-nineteenth-century lighthouse engineering. The lighthouse retains a remarkable degree of integrity of feeling and setting due to the preservation of Naushon Island's natural landscape.

The Tarpaulin Cove Light was located on Naushon Island to help guide vessels through Vineyard Sound. In Isaiah William Penn Lewi, also known as I.W.P. Lewis, was hired by Water Forward, Secretary of the Treasury, to review the spending of the Lighthouse Service. Lewis visited the lighthouses of Massachusetts, New Hampshire and Maine and produced a report of his findings. According to *The History of Tarpaulin Cove Light, Gosnold Massachusetts,* Lewis' report stated the "tower is not high enough to clear the land to the westward so the light in that directions is of no use to vessels near the shore (D'Entremont, 2021c)." In 1856 and again in 1870 improvements were made to the lens and frequency of flashes to improve the visibility of the light (D'Entremont, 2021c). The lighthouse remains an active aid to navigation. This maritime setting is inextricably linked to the Tarpaulin Cove Light's historic use and significance.

3.8 The Clark's Point Light

3.8.1 Physical Description and Existing Conditions

The Clark's Point Light consists of a square wood tower and cast-iron lantern atop Fort Taber, a seven-sided, three-story, D-shaped granite fort sited on the tip of a promontory south of the city of New Bedford. The tower is painted white and contains six-over-six wood windows (Butler, 1973).

3.8.2 Historic Context

An early lighthouse at Clark's Point was completed in 1797 but burned about a year later. Its replacement was also destroyed by fire in 1803. A stone tower was completed in 1804 and extended in 1818. The lantern was replaced in 1865. Construction of Fort Taber began in 1857 and was completed in 1863 adjacent to the existing 1804 lighthouse. Because the tower's walls blocked views of the lighthouse, a new wood tower was built onto the fort and the 1865 lantern was relocated and entered into service in 1869. The stone lighthouse was demolished in 1906. The establishment of an offshore light at Butler Flats in 1898 rendered the Clark's Point Light obsolete. The fort and lighthouse were restored in the 1970s and again in 2000-2001. The site is now maintained as a public park (Butler, 1973; D'Entremont, 2021d). The lighthouse and fort were listed in the NRHP as part of the Fort Taber Historic District in 1973.

3.8.3 NRHP Criteria and the Maritime Visual Setting

The Clark's Point Light meets NRHP Criteria A and C for its association with the development of American coastal fortifications, and as an example of mid-nineteenth century military and lighthouse engineering. The lighthouse and fort retain a high degree of integrity of setting and feeling.

The Clark's Point Light is located in Buzzard's Bay on the west side of the mouth of the Acushnet River and New Bedford Harbor and was located in this location to guide vessels into New Bedford Harbor. In 1818 the light was located 52 feet above sea level and when the lighthouse was replaced in 1869 the light was at a height of 68 feet above sea level (D'Entremont, 2021d). This maritime setting is a key component of the Clark's Point Light's historic significance.

3.9 The Butler Flats Light Station

3.9.1 Physical Description and Existing Conditions

The Butler Flats Light Station is a 53-foot-tall "sparkplug" type lighthouse located roughly 2,000 feet offshore east of Clark's Point at the entrance to New Bedford Harbor. The lighthouse consists of a cylindrical brick tower and cast-iron lantern atop a stone- and concrete-filled cast iron caisson. The caisson foundation was sunk directly into the soft, muddy bottom of New Bedford Channel. The interior contains four levels of storage and living space, as well as a watchroom. Curved iron plates at the top of the caisson deflect waves and support a covered exterior gallery (Tait et al., 1986).

3.9.2 Historic Context

The Butler Flats Light Station was constructed in 1898 to replace the Clark's Point Light (see Section 3.8.2). At the time, New Bedford was an important manufacturing and shipping center, although its heyday as a whaling port was long past. The light station was designed by notable author, artist, and engineer F. Hopkinson Smith. Remarkably, the Butler Flats Light Station had only two keepers from the time of its construction in 1898 until the USCG assumed control of the Lighthouse Service in 1942. Capt. Amos Baker, Jr. served as keeper from 1898 until his death in 1911. His son, Charles A. Baker, served as assistant keeper from 1898 to 1911 and as keeper from 1911 to 1942. USCG keepers assumed operation of the light station in 1942 and in 1975 a new automated light and fog signal were constructed on the nearby New Bedford hurricane barrier. The City of New Bedford acquired the light station in 1978 and it subsequently became one of the first solar-powered light stations in the nation (Tait et al., 1986; D'Entremont, 2021e).

3.9.3 NRHP Criteria and the Maritime Visual Setting

According to its NRHP nomination form, the Butler Flats Light Station meets NRHP Criteria A, B, and C for its association with the development of aids to navigation in Massachusetts and as an example of a caisson type lighthouse, and as the only lighthouse of its type designed by a known marine architect.

As stated above, the Butler Flats Light Station was constructed to replace Clark's Point Light to guide vessels to the mouth of the Acushnet River and New Bedford Harbor. The light station's offshore maritime setting is inextricably linked to its historic use and significance.

3.10 The Nobska Point Lighthouse

3.10.1 Physical Description and Existing Conditions

The Nobska Point Lighthouse is located high on a rocky promontory above the entrance to Woods Hole Harbor. It is a conical brick-lined cast iron tower with a cast iron lantern. Arched windows at the three lower levels feature pedimented hoods while the fourth level has porthole windows. The gallery below the lantern is supported on cast iron brackets. The entrance to the tower is via a small gable-roofed wood shingled vestibule. The keeper's house is a wood frame one-and-one-half-story gable-and-ell residence with wood shingle siding. The adjoining assistant keeper's residence is of similar form and materials but smaller proportions. A brick oil house and a brick radio beacon building are also present on the site (Tait et al., 1986).

3.10.2 Historic Context

The first lighthouse at Nobska Point was completed in 1828. It was replaced with the current tower and keeper's house in 1876. An assistant keeper's house was added in 1900. The light was electrified in 1919. It was staffed by civilian keepers until 1972 and finally automated in 1985, when it became the residence of the Commander of the USCG South East Sector New England. The last Commander to reside at Nobska Point moved out in 2013 and the USCG transferred ownership of the property to the Town of Falmouth. The Friends of Nobska Point Light maintains the property and began a major restoration in 2017 (Tait et al., 1986; Friends of Nobska Light, 2021).

3.10.3 NRHP Criteria and the Maritime Visual Setting

The Nobska Point Lighthouse meets NRHP Criteria A and C for its association with the development of aids to navigation in Massachusetts and as an excellent example of an intact lighthouse complex including the tower, keepers' residences, and ancillary buildings. The property's scenic qualities and dramatic setting above Woods Hole Harbor are noted in the NRHP nomination.

As stated above, the Nobska Point Lighthouse is located high on a rocky promontory above the entrance to Woods Hole Harbor between Buzzard's Bay and Vineyard Sound. Its location allows for the light to be seen in all directions (Tait et al., 1986). As Falmouth was a major whaling port in the nineteenth century, the addition of a lighthouse to assist vessels traveling in and out of Woods Hole Harbor was essential. According to the *History of Nobska Point Lighthouse, Woods Hole, Massachusetts,* more than 10,000 vessels passed through the area when the lighthouse was constructed in 1829 (D'Entremont, 2021h). In 1888, after the lighthouse had been replaced in 1876, the lens was updated with "a red sector to warn mariners of the dangerous L'Hommedieu and Hedge Fence shoals" (D'Entremont, 2021h).

4.0 MITIGATION MEASURES

Mitigation measures at the historic properties are detailed in this section. These applicant-proposed mitigation measures were developed on behalf of Revolution Wind by individuals who meet the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61) and are appropriate to fully address the nature, scope, size, and magnitude of adverse effects including cumulative effects caused by the Project, NRHP-qualifying characteristics of each historic property that would be affected. These mitigation measures also include actions to respond to some reasonably foreseeable hazards unrelated to the Project that pose risks to the long-term preservation of affected historic properties, such as climate change. Revolution Wind has prepared this draft HPTP for inclusion in the DEIS and subsequent review, revision and refinement by consulting parties.

4.1 Assessment, Planning, Restoration, and Institutional Development

4.1.1 Purpose and Intended Outcome

The eight historic lighthouses addressed in this HPTP each have a unique set of needs for physical repair and maintenance, hazard mitigation, interpretation, and, for some, institutional development for their non-profit owners or caretaking organizations. Funding will be provided to support the prioritized needs of each of the lighthouses. Consultation with the Participating Parties will determine the exact scope of work for each of these historic properties; however, the intent of this mitigation measure is to provide funding for assessment, planning, and institutional development to enhance the long-term preservation, resiliency, and interpretation of the historic properties and will help preserve the character of existing historic shoreline settings.

4.1.2 Scope of Work

The scope of work for each historic lighthouse will be determined in consultation with the Participating Parties, and in compliance with applicable standards (see Section 4.1.4).

4.1.3 Methodology

Revolution Wind will release a request for proposals (RFP) for consultant services for the scope of work identified for each historic lighthouse and select a consultant to perform the scope of work by qualified consultants, contractors, or other professionals. Any draft documentation (e.g., exhibit materials, plans and specifications, reports) will be developed in consultation with the Participating Parties and will be distributed for review and comment. Final deliverables will incorporate comments received and will be distributed to the Participating Parties, as applicable. Prior to any work, existing condition documentation, including photographs will be completed and distributed to the Participating Parties. Upon completion of any work, as-built documentation, including photographs will be completed and distributed to the Participating Parties.

4.1.4 Standards

The project will comply with following standards, as applicable:

- Applicable state and local building codes, guidance and regulations;
- All existing preservation restrictions and/or easements (see Section 2.2.2);
- *Preservation Brief 17: Architectural Character – Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character* (Nelson, 1988);
- *Preservation Brief 47: Maintaining the Exterior of Small and Medium Size Historic Buildings;*
- *National Register Bulletin 34: Guidelines for Evaluating and Documenting Historic Aids to Navigation;*
- *Historic Lighthouse Preservation Handbook;*
- *IALA-AISM Lighthouse Conservation Manual;*
- The Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61), as applicable; and
- The Secretary of the Interior's *Standards for Treatment of Historic Properties* (36 CFR 68).

4.1.5 Documentation

The following documentation is to be provided for review by the Participating Parties:

- RFPs;
- Proposals by qualified consultants in response to the RFP;
- Photographs and documentation of existing conditions, as applicable;
- Draft deliverables;
- Final deliverables; and
- As-built documentation and photography, as applicable.

4.1.6 Funds and Accounting

Funding amounts will be determined following BOEM's release of their findings of adverse effects and consulting party review of the draft HPTP and the DEIS. The final version of the HPTP will include specifics concerning funding amounts and the mechanisms for funding the mitigation measures.

5.0 IMPLEMENTATION

5.1 Timeline

The timeline for implementation of the mitigation measures will be determined in consultation with the Participating Parties based on the agreed upon mitigation measures described in the final version of this HPTP. This HPTP will be reviewed by and further developed in consultation with Participating Parties concurrent with BOEM's NEPA substitution schedule[3] for RWF, which is currently anticipated to include the following:

- **May 3, 2022 to July 1, 2022** – Distribution of the Finding of Effect document, on historic properties, to consulting parties (to occur between).
- **May 3, 2022 to August 1, 2022** – 30-day comment period on the Finding of Effect document (to occur between).
- **September 2, 2022** – Distribution of the Draft Memorandum of Agreement (MOA) and the Draft Environmental Impact Statement (DEIS) to consulting parties.
- **September 2, 2022 to October 17, 2022** – 45-day comment period by consulting parties on the MOA and DEIS
- **October 18, 2022 to December 19, 2022** – Distribution of the revised MOA to consulting parties (to occur between).
- **October 18, 2022 to January 19, 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **December 2022 to February 2023** – Distribution of the revised MOA to consulting parties (to occur between).
- **December 2023 to March 2023** – 30-day comment period on the revised MOA (to be determined for a 30-day period between).
- **February 2023 to April 2023** – Distribution of the Final MOA to consulting parties (to occur between).
- **March 2023 to June 2, 2023** – 30-day signing period for consulting parties (to begin no later than a date between).
- **June 2, 2023** – Release of Final Environmental Impact Statement (FEIS).
- **June 2, 2023 to July 3, 2023** – 30-day review period for the FEIS.
- **July 7, 2023** – NEPA Record of Decision (ROD) issued by BOEM.

The final version of this HPTP included in the FEIS will include a timeline for implementation of the final/agreed upon mitigation measures described herein. It is anticipated that the mitigation measure identified in Section 4.0 will commence within 2 years of the execution of the MOA unless otherwise agreed by the consulting parties and accepted by BOEM. Per Section 4.0, the Participating Parties will have a minimum of 30-days to review and comment on all draft reports or other work products developed for this HPTP. Revolution Wind assumes that the proposed scope of work will be completed within 5 years of the

[3] The timeline is subject to change and is based on current available information.

execution of the MOA unless a different timeline is agreed upon by consulting parties and accepted by BOEM.

5.2 Organizational Responsibilities

5.2.1 Bureau of Ocean Energy Management (BOEM)

BOEM remains responsible for making all federal decisions and determining compliance with Section 106. BOEM has reviewed this HPTP to ensure, at minimum, it includes the content required.

- BOEM remains responsible for making all federal decisions and determining compliance with Section 106;
- BOEM, in consultation with the Participating Parties, will ensure that mitigation measures adequately resolve adverse effects, consistent with the NHPA;
- BOEM must accept the final HPTP before Revolution Wind may commence any of the actions included in the HPTP;
- BOEM will be responsible for sharing the annual summary report with Participating Parties; and
- BOEM is responsible for consultation related to dispute resolution.

5.2.2 Revolution Wind, LLC

Revolution Wind will be responsible for the following:

- Considering the comments provided by the Participating Parties in the development of this HPTP;
- Funding the mitigation measures specified in Section 4.0;
- Completion of the scope/s of work in Section 4.0;
- Ensuring all Standards in Section 4.0 are met;
- Providing the Documentation in Section 4.0 to the Participating Parties for review and comment;
- Annual Reporting to BOEM; and
- Revolution Wind will be responsible for ensuring that all work that requires consultation with Tribal Nations are performed by professionals who have demonstrated professional experience consulting with federally recognized Tribes.

5.2.3 Other Parties, as Appropriate

Revolution Wind does not anticipate additional consulting parties, should any be determined, this will be updated.

5.3 Participating Party Consultation

Revolution Wind has provided this draft HPTP to BOEM for inclusion in the DEIS for review by Participating Parties to provide meaningful input on the resolution of adverse effects to and form(s) of implementing mitigation at the historic properties. As part of the development of this draft HPTP, Revolution Wind has conducted targeted outreach with the Participating Parties identified in Section 2.3. As of July 2022, this outreach has included the following:

- Stakeholder Consultation Meeting to Review Avoidance, Minimization, and Mitigation Measures for the Revolution Wind Farm – Lighthouses, February 17, 2022.

Participating Parties will be provided opportunity for review and comment on the HPTP concurrent with BOEM's anticipated NEPA substitution schedule for Revolution Wind Farm (see Section 5.1). It is anticipated that subsequent coordination to further refine the HPTP may include meetings, conference calls, HPTP draft reviews and document exchanges, or similar means of communication of information. BOEM will be invited to participate in these consultations between Revolution Wind and the Participating Parties regarding revision and refinement of this HPTP, should it choose.

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ATTACHMENT 28 – REVOLUTION WIND EXPORT CABLE ONSHORE SUBSTATION AND INTERCONNECTION FACILITY, NORTH KINGSTOWN, RHODE ISLAND: PROCEDURES GUIDING THE DISCOVERY OF UNANTICIPATED CULTURAL RESOURCES AND HUMAN REMAINS

[Insert ATTACHMENT 28 – REVOLUTION WIND TERRESTRIAL UNANTICIPATED DISCOVERY PLAN]

Revolution Wind Export Cable Onshore Substation and Interconnection Facility
North Kingstown, Rhode Island

Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains

July 2022

Revolution Wind, LLC (Revolution Wind), a 50/50 joint venture between Orsted North America Inc. (Orsted NA) and Eversource Investment LLC (Eversource), proposes to construct and operate the Revolution Wind Farm Project (Project). The wind farm portion of the Project will be located in federal waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0486. The Project also includes up to two submarine export cables (RWEC), generally co-located within a single corridor through both federal waters and state waters of Rhode Island. The RWEC will make landfall at Quonset Point in North Kingstown, Rhode Island and will interconnect to an existing electric transmission system via the Davisville Substation, which is owned and operated by The Narragansett Electric Company (TNEC), located in North Kingstown, Rhode Island.

Revolution Wind is committed to the protection and preservation of cultural resources, in accordance with federal and state legislation, and is continuing that commitment as part of the onshore components of the Project. Revolution Wind recognizes that despite intensive cultural resource field investigations that were performed in the spring and summer of 2021 (Forrest and Waller 2021), it is nonetheless possible that potentially significant archaeological resources could be discovered during onshore Project construction, particularly during excavation. Revolution Wind also recognizes the requirement for compliance with federal, state, and municipal laws and regulations regarding the treatment of human remains, if any are discovered.

The procedures guiding the unanticipated discovery of cultural resources and human remains detailed herein ("Procedures") were developed on behalf of Revolution Wind and in consultation with the Rhode Island Historical Preservation and Heritage Commission (RIHPHC)/office of the State Historic Preservation Officer (SHPO), and federally recognized Native American tribes. These Procedures summarize the approach that Revolution Wind will use to address any unanticipated discoveries of archaeological resources or human remains during construction activities within the onshore portion of the Project's area of potential effect (APE).

The purpose of archaeological investigations is to determine the presence or absence of historic properties, including archaeological sites, within a project APE. These archaeological investigations are conducted in accordance with standards set forth in Section 106 of the National Historic Preservation Act of 1966, as amended, (54 USC 36018) and its implementing regulations (36 CFR 800), specifically, those procedures regarding "post-review discoveries" as outlined in 36 CFR 800.13. All work is undertaken pursuant to the Secretary of the Interior *Standards for Archaeology and Historic Preservation* (48 FR 44716-44742); the *Performance Standards and Guidelines for Archaeology in Rhode Island* (RIHPHC 2021); and the applicable laws and regulations pertaining to the cultural resources and human remains including the Rhode Island Historical Cemeteries Act (Rhode Island General Law [R.I.G.L.] 23-18-11 *et seq*.) and the Antiquities Act of Rhode Island (R.I.G.L. 42–45.1).

Cultural Sensitivity Training

Revolution Wind acknowledges the sensitivity of the Project and surrounding area to potentially contain significant archaeological sites including Native American burials. The Public Archaeology Laboratory Inc. (PAL) Principal Investigator will give Revolution Wind and its contractor construction supervisors cultural and archaeological sensitivity training before the start of construction. The purpose of this training will be to review Revolution Wind's commitments to cultural resource compliance, review the general results of the archaeological investigations conducted within the onshore portions of the Project APE, and to provide an overview of the general cultural history of the area so that Revolution Wind and their contractors are aware of the types of archaeological resources that may be encountered during construction. The training program will outline the procedures that will be followed if a significant cultural resource or archaeological deposit is discovered during construction.

Notification Procedures

The identification of archaeological resources requires experience in recognizing and identifying potentially and significant archaeological sites and deposits. Revolution Wind is committed to having qualified archaeological monitors onsite during any ground disturbing construction activities. Revolution Wind will provide the Narragansett Indian Tribe, the Wampanoag Tribe of Gay Head/Aquinnah, Mashpee Wampanoag Tribe, the Mohegan Tribe, the Shinnecock Indian Nation, the Delaware Tribe of Indians, the Delaware Nation, and the Mashantucket Pequot Tribal Nation Tribal Historic Preservation Offices (THPOs) the opportunity to have their tribal monitors and cultural resource specialists onsite during archaeological or construction activities.

The following details the plan that Revolution Wind and their contractors will follow if archaeological resources or human remains are identified during construction.

During Construction

<u>Archaeological Discoveries</u>

1. Possible archaeological remains may be discovered by archaeological and tribal monitors during construction. If anyone including construction personnel identify suspected cultural or archaeological resources, the archaeologist on site should immediately be notified such that the qualified archaeological monitor can issue a stop-work order. If suspected artifacts or archaeological features are uncovered during a construction activity, qualified archaeological monitors will have the authority to stop work in the vicinity of the discovery until it can be determined if the materials are cultural and whether they represent a potentially significant site or archaeological deposit.

2. Archaeological monitors will immediately notify Revolution Wind's Environmental Compliance Manager. Notification will include the activity, specific work area including location/address and construction site (onshore substation, interconnection facility, export cable route, etc.), and provide digital photographs of the find.

3. Revolution Wind will issue a Stop Work order and direct the contractor to secure the area by flagging or fencing off the area of the archaeological discovery. Any discovery made on a weekend or overnight hours will be protected until all necessary parties have been notified of the discovery. The contractor will not resume work in the vicinity of the find until Revolution Wind's Environmental Compliance Manager has granted clearance.

4. PAL, in consultation with the onsite tribal monitors, will determine if the site is potentially significant and notify the RIHPHC and BOEM. Revolution Wind, their contractors, and PAL will work with the RIHPHC and the THPOs to develop and implement a site treatment plan.

5. Since the area of any potential discovery will have been partially disturbed by construction, the objective of cultural resource investigations will be to evaluate data quickly so that notifications are made and consultation can proceed. If archaeological investigations are required, Revolution Wind will inform the construction supervisor that no construction work in the immediate vicinity of the discovery can proceed until archaeological fieldwork is complete. The area will be flagged as being off-limits for work but will not be identified as an archaeological site *per se* to protect the resource(s).

6. The duration of any work stoppages will be contingent upon the significance of the identified cultural resource(s) and consultation among Revolution Wind, BOEM, RIHPHC, THPOs, and other parties to determine treatment to avoid, minimize, or mitigate any adverse effects to the identified site.

7. Once all treatment measures are complete, Revolution Wind will notify the contractor that construction work may proceed.

Human Remains Discoveries

If human remains are encountered during Project construction, they will be handled in accordance with the Rhode Island Historic Cemeteries Act (Appendix A) and North Kingstown Code of Ordinances, Part III, Chapter 12, Section 12–15 (Appendix B) and guided by the policy statement adopted by the Advisory Council on Historic Preservation ([Advisory Council]; see *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects*, (Appendix C). Human remains, if present, are likely to be found in deeply buried or areas unimpacted by previous construction.

Human remains will be treated with the utmost dignity and respect at all times. Skeletal remains and/or associated artifacts will be left in place and not disturbed. No remains or associated materials will be collected or removed until all notifications have been made, appropriate consultation has taken place, and a plan of action has been determined. The procedures that will be followed in the event that human remains are discovered during Project construction are:

1. If PAL and/or tribal monitors identify human remains or possible human remains, all construction work in the vicinity of the find that could affect the integrity of the remains will cease. The remains will not be touched, moved, or further disturbed. PAL will notify Revolution Wind and with the assistance of onsite contractors take measures to ensure site security.

2. PAL/Revolution Wind will record the exact location of the find, its time of discovery, and will immediately notify the RI State Police and the Town of North Kingstown's Building Inspector in accordance with Rhode Island Historic Cemeteries Act and the North Kingstown Code of Ordinances. BOEM will also be notified as soon as practicable.

3. The Town will notify the Office of the State Medical Examiner (OSME). If the OSME determines the remains are less than 100 years old, then their treatment becomes the responsibility of the State Police and the Town. If the OSME determines the remains are more than 100 years old, the OCME will notify the RIHPHC State Archaeologist. The State Archaeologist, PAL and tribal monitors will determine if the remains are Native American.

4. The Town of North Kingstown, State Archaeologist, and if the remains are Native American, the THPOs will discuss whether there are prudent and feasible alternatives to protect the remains. The results of this consultation will be made in writing. If it is not possible to protect the remains, they may be excavated only under a permit issued by the RIHPHC after the review of a recovery plan that specifies a qualified research team, research design, and plan for the disposition of the remains consistent with the results of consultation and permission from the North Kingstown Town Council.

5. In all cases, due care will be taken in the excavation, transport, and storage of any remains to ensure their security and respectful treatment.

Applicable Laws

Federal

- Section 106 of the National Historic Preservation Act of 1966, as amended (54 USC 306108) and its implementing regulations "Protection of Historic Properties" (36 CFR part 800).

Rhode Island

- Rhode Island Historic Cemeteries Act: Rhode Island General Law 23-18-11 *et seq*. (Appendix A)

North Kingstown

- North Kingstown Code of Ordinances, Part III, Chapter 12, Section 12–15 (Appendix B)

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TRIBAL HISTORIC PRESERVATION OFFICES

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APPENDIX A: RHODE ISLAND GENERAL LAWS TITLE 23 - HEALTH AND SAFETY - CHAPTER 23-18 CEMETERIES

SECTION 23-18-11

§ 23-18-11 Regulation of excavation around cemeteries. – (a) The city or town council of any municipality may by ordinance prescribe standards regulating any construction or excavation in the city or town, when those standards are reasonably necessary to prevent deterioration of or damage to any cemetery or burial ground, or to any structures or gravesites located in any cemetery or burial ground. The rules and regulations shall not apply to the ordinary installation of gravesites or of monuments, markers, or mausoleums.

(b) No city or town shall permit construction, excavation or other ground disturbing activity within twenty-five feet (25') of a recorded historic cemetery except in compliance with the following provisions:

(1) The boundaries of the cemetery are adequately documented and there is no reason to believe additional graves exist outside the recorded cemetery and the proposed construction or excavation activity will not damage or destructively alter the historic cemetery through erosion, flooding, filling, or encroachment; or

(2) The proposed construction or excavation activity has been reviewed and approved by the city or town in accordance with § 23-18-11.1.

(c) Whenever an unmarked cemetery or human skeletal material is inadvertently located during any construction, excavation, or other ground disturbing activity, including archaeological excavation, the building official of the city or town where the unmarked cemetery or human skeletal material is located shall be immediately notified. The building official shall, in turn, notify the state medical examiner and the Rhode Island historical preservation and heritage commission if the grave, cemetery, or skeletal material appears to be historic. Prior to the continuation of any further construction, excavation, or other ground disturbing activity, and unless the provisions of § 23-18-7 shall apply, the property owner shall undertake an archaeological investigation to determine the boundaries of the unmarked cemetery and shall so inform the building official. In the event that the cemetery meets the criteria for a historic cemetery, the building official shall so advise the recorder of deeds of the city or town who shall record and register the cemetery in accordance with the provisions of § 23-18-10.1.

SECTION 23-18-11.1

§ 23-18-11.1 Permit required to alter or remove historic cemetery – Powers of city or town council – Appeal. – (a) Before an agency or a property owner may authorize or commence alteration or removal of any historic cemetery, the agency or owner must apply to the city or town council where the historic cemetery is located for a permit to alter or remove. The city or town council shall prescribe by ordinance standards to regulate the alteration or removal of any historic cemetery within its municipal limits, but shall at a minimum provide that:

(1) The applicant will examine all alternatives, and demonstrate that no prudent or feasible alternative to the proposed alteration is possible;

(2) The city or town provide for notification and participation in the permitting process of parties which may be interested in the proposed alteration or removal by virtue of their status as a governmental health or historic preservation authority, or as a private or nonprofit historical, genealogical or civic

organization, or, in the case of American Indian cemeteries and burial grounds, the appropriate tribal organization; and
(3) The city or town provide for due consideration of the rights of descendants in any application to substantially alter or remove a historic cemetery.

(b) When an application for alteration or removal of a historic cemetery has been made and the boundary is unknown or in doubt, the city or town may require that the applicant, at its own expense, conduct an archaeological investigation to determine the actual size of the cemetery prior to final consideration by the city or town of the application to alter or remove.

(c) After due consideration, the city or town council may grant the application to alter or remove the historic cemetery in whole or in part, under the supervision of an archaeologist and with any restrictions and stipulations that it deems necessary to effectuate the purposes of this section, or deny the application in its entirety. Any person or persons aggrieved by a decision of the city or town council shall have the right of appeal concerning the decision to the superior court and from the superior court to the supreme court by writ of certiorari.

(d) Nothing in this section shall be deemed to contravene the authority of municipal bodies under § 45-5-12 to hold, manage, repair, or maintain any neglected burial ground.

SECTION 23-18-11.2

§ 23-18-11.2 Regulation of excavation – Removal and transfer of graves and cemeteries – Penalties. – (a) The city or town council of any municipality may by ordinance prescribe standards, in addition to those required by § 23-18-10, regulating the excavation, removal, and transfer of any graves, grave sites, and cemeteries in the municipality so as to provide an accurate record of any activity and to ensure that any remains removed are properly re-interred and the location of the new interment is recorded. In the absence of a local ordinance establishing standards, regulations adopted by the historical preservation and heritage commission shall govern. A report of any grave removal and relocation from one cemetery or burial ground to another shall be filed in the clerk's office for each municipality and shall, to the extent permitted by law, be available for public inspection. In instances where there is a headstone or other burial marker identifying the original grave, the headstone or burial marker shall be erected on the site to which any remains are transferred.

(b) To the extent not promulgated pursuant to § 23-3-5.1, the state registrar of vital records shall promulgate regulations to establish a system of record-keeping to allow descendants to locate their ancestors' graves in Rhode Island.

(c) Any person convicted of violating this section shall be subject to a fine of not more than one thousand dollars ($1,000) and such fine shall be deemed civil in nature and not a criminal penalty.

(d) The provisions of this section shall be considered to be in addition to any other penalties provided for desecration or vandalism to cemeteries.

SECTION 23-18-13

§ 23-18-13 Notification of historical preservation and heritage commission. – The historical preservation and heritage commission shall be notified whenever an ancient burial place contains or is suspected to contain the remains of one or more persons.

APPENDIX B: NORTH KINGSTOWN CODE OF ORDINANCES, PART III, CHAPTER 12, SECTION 12-15 – HISTORICAL AND ARCHAEOLOGICAL BURIAL SITES

a) *Authority*. In compliance with RIGL 1956, § 23-18-1 et seq., the town adopts this section to govern the preservation of historic and archaeological burial sites in the town.
b) *Purpose.* The town council recognizes that historic and archeological gravesites possess archaeological and scientific value and are often of great artistic, cultural and religious significance and represent for all cultures a respect for the sanctity of human life. It is, therefore, the policy of the town that marked or unmarked historic cemeteries are to be preserved and are not to be altered or removed except as provided for in this section.
c) *Definitions*. The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them in this subsection, except where the context clearly indicates a different meaning:

Applicant means the owner of the land on which an archeological burial site or family cemetery is located for which a permit must be sought for alteration or removal.

Archaeological burial site means an area of land which has been designated and/or used for the interment of human remains in the prehistoric or distant past. Archaeological burial sites may include American Indian or other ethnic groupings.

Family cemetery means a historic cemetery which is not associated with a specific religious organization but which is the site of burial for persons related by blood, marriage or household.

Historic cemetery means any tract of land which has been used for a period in excess of 100 years as a burial place, whether or not marked with a historic marker or gravestone, including but not limited to ancient burial places known to contain the remains of one or more American Indians. For the purposes of this section, the term "historic cemetery" also includes an area 25 feet in width around the perimeter of the cemetery.

Human remains means any parts or remains of deceased persons including skeletal remains or cremated ashes.

Grave means any site where human remains have been purposefully interred. The term also includes gravemarkers, funerary objects and associated cultural remains and artifacts. A grave includes mausoleums, crypts or other structures designed to house human remains.

Least disruptive means means a means of construction, excavation, removal or other activity which, in the opinion of the state historic preservation commission, has the least overall destructive impact on the grave, human remains or cemetery.

Owner means the owner of a parcel of land.

Religious cemetery means any cemetery owned or maintained by a religious organization.

Religious organization means the organization representing the adherents of any religious society.

Site alteration plan means a document showing in written text and by illustration the proposed alteration of a historic cemetery, an archaeological burial site or a family cemetery, including detailed specifications for alteration, removal and reinterment of human remains.

Town means the town, its agents or its officers.

d) Procedures. Procedures regarding disturbance of historic cemeteries or archaeological burial sites shall be as follows:

1) It shall be unlawful for any person to disturb, disrupt, excavate, deposit, fill in or on, remove or destroy gravemarkers, burial objects or buried human remains or conduct any other activities that would damage or diminish the integrity of any historic cemetery or archaeological burial site or family cemetery without first obtaining a permit to alter or remove such historic cemetery, archaeological burial site or family cemetery from the town council.

2) Once a discovery of a previously unknown burial site is made, the owner or contractor shall immediately notify the building inspector who in turn shall contact the state medical examiner and state historical preservation commission pursuant to RIGL 1956, § 23-18-1 et seq.

3) The town shall require the cessation of construction activities pending preliminary verification of the property as a human burial site by the state medical examiner or historic preservation commission. If the site is verified as a human burial site, work within 25 feet of the site shall be halted unless or until a permit to alter or remove is issued by the town pursuant to this section.

4) The owner shall be required, at the owner's expense, to conduct an archaeological investigation of the area to establish the boundaries of the cemetery/burial site using the least disruptive means feasible. The least disruptive means shall be determined by the town through the town's consultation with the state historic preservation commission (RIHPC). A survey report shall be produced incorporating the findings of the investigation in test and graphic form.

5) The applicant shall then submit the report and a detailed engineering plan, as required and identified in subsection (d)(8)a of this section of the proposed construction project and all other proposed activities on the property that in any manner might lead to or necessitate any disruption of the cemetery/burial site.

6) The applicant shall also submit a detailed site alteration plan proposal of the extent and method of removal of human remains and a reburial plan in text and drawing of the new gravesite.

7) The town council may issue a permit to allow the alteration or removal of historic cemeteries, archaeological cemeteries or family cemeteries only after concluding, based on evidence submitted to the council at a public hearing, that all alternatives to the proposed activity have been examined and that no prudent and feasible alternative to the proposed activity exists or that the alteration serves the interests, health, welfare and safety of the public and is not solely for commercial expediency.

8) The applicant shall submit the following to the town council prior to the consideration of any application for a permit to remove and/or alter a historic cemetery or an archaeological burial site:

   a. Detailed site plans drawn to scale by a licensed professional registered land surveyor or professional engineer, as applicable, at a minimum scale of 1″=50′, showing the boundaries of the property in question, topographical contour intervals of no more than one foot, a surveyed boundary of the cemetery and a setback area of no less than 25 feet, and a proposed plan of all improvements proposed on the site that would necessitate disturbance of the cemetery.

b. If known, a written description of the cemetery, its age and condition, and historical importance; whether the cemetery is religious, family, organization, publicly owned or other kind of cemetery; a listing of names and vital dates of those interred as may be determined from gravemarkers on site; and a cemetery plan indicating position of graves and to the extent possible the identities of those interred.

c. A detailed site alteration plan indicating the extent of disruption of the cemetery, methods of construction or removal of human remains, reburial plan, including in text and illustration the relocation of graves.

d. If a family cemetery, a genealogical study to identify whether decedents of the families of the interred still reside in the state.

e. If a religious cemetery, a listing of the religious organization that owns or maintains the cemetery.

f. Any further information and study the town council deems necessary to complete its consideration of the request to alter a cemetery in compliance with RIGL 1956, § 23-18-1 et seq.

e) *Hearing.* A hearing shall be conducted in accordance with the following:

1) *Public notice*. Once the required documents are submitted by an applicant and published, the town council shall set the date for a public hearing. Notice of the date, time and location of the public hearing shall be at the applicant's expense, in a local newspaper, for a period of not less than two weeks prior to the hearing. The state historic preservation commission shall be notified not less than two weeks prior to the scheduled hearing, and an advisory opinion shall be requested by pertinent town staff.

2) *Notice to interested parties.* Notice to interested parties shall be given as follows:

a. For archaeological burials and historic Native American graves, the town shall cause the tribal council of the Narragansett Tribe to be notified by regular mail of the subject, date and time of the scheduled hearing.

b. If an application involves the cemetery of an extant religious society, such society shall be so notified by regular mail of the scheduled hearing.

c. If the application involves a family cemetery, the interred of which have living lineal descendants, the applicant, at the applicant's expense, shall make all reasonable efforts to notify the lineal descendants as to the scheduled hearing, which efforts may include sending notice to the descendants via first class mail or publication of the notice in a newspaper of statewide circulation at least once per week for two successive weeks prior to the scheduled hearing.

3) *Burden of proof.* At the hearing, the applicant shall prove to the satisfaction of the town council that:

a. The applicant has examined all possible alternatives and conclusively demonstrated that no prudent and feasible alternative to the proposed alteration is possible; or

b. The proposed alteration serves the interests of health, welfare and safety of the public and is not solely for commercial expediency.

f) *Final action.* The town council shall conduct a public hearing on the proposed project and shall render a decision approving, denying or approving with reasonable conditions the proposed site alteration plan and may set other conditions and/or requirements necessary to carry out the purposes of RIGL 1956, § 23-18-1 et seq.

g) *Legal status.* Nothing in this section shall be construed to prohibit the routine maintenance and repair of historical gravesites or the use of historic cemeteries as places of interment, nor shall it be construed to preclude the town boards or commissions or agents from otherwise acting within their authority to regulate and protect historical and archaeological cemeteries.

h) *Severability.* If any subsection, clause, provision or portion of this section shall be held invalid or unconstitutional by a court of competent jurisdiction, such decision shall not affect the validity or constitutionality of any other subsection, clause, provision or portion of this section.

i) *Appeal.* Any person aggrieved by the decision of the town council shall have a right to appeal the decision to the superior court pursuant to RIGL 1956, § 23-18-11.1.

(Ord. No. 94-25, § 1, 11-14-1994)

Cross reference— Historical zoning, § 21-331 et seq.

State Law reference— Historical and archaeological burial sites, RIGL 1956, § 23-18-1 et seq.; historic burial sites, RIGL 1956, § 23-18-10.1; historic preservation, RIGL 1956, § 42-45-1 et seq.

APPENDIX B: ADVISORY COUNCIL ON HISTORIC PRESERVATION POLICY STATEMENT REGARDING TREATMENT OF BURIAL SITES, HUMAN REMAINS AND FUNERARY OBJECTS

Preserving America s Heritage

ADVISORY COUNCIL ON HISTORIC PRESERVATION

POLICY STATEMENT
REGARDING
TREATMENT OF BURIAL SITES, HUMAN REMAINS AND FUNERARY OBJECTS

Preamble: This policy offers leadership in resolving how to treat burial sites, human remains, and funerary objects in a respectful and sensitive manner while acknowledging public interest in the past. As such, this policy is designed to guide federal agencies in making decisions about the identification and treatment of burial sites, human remains, and funerary objects encountered in the Section 106 process, in those instances where federal or state law **does not prescribe a course of action.**

This policy applies to all federal agencies with undertakings that are subject to review under Section 106 of the National Historic Preservation Act (NHPA; 16 U.S.C. § 470f), and its implementing regulations (36 CFR Part 800). To be considered under Section 106, the burial site must be or be a part of a historic property, meaning that it is listed, or eligible for listing, in the National Register of Historic Places.

The Advisory Council on Historic Preservation (ACHP) encourages federal agencies to apply this policy throughout the Section 106 process, including during the identification of those historic properties. In order to identify historic properties, federal agencies must assess the historic significance of burial sites and apply the National Register criteria to determine whether a property is eligible. Burial sites may have several possible areas of significance, such as those that relate to religious and cultural significance, as well as those that relate to scientific significance that can provide important information about the past. This policy does not proscribe any area of significance for burial sites and recognizes that the assessment must be completed on a case-by-case basis through consultation.

The policy is not bound by geography, ethnicity, nationality, or religious belief, but applies to the treatment of all burial sites, human remains, and funerary objects encountered in the Section 106 process, as the treatment and disposition of these sites, remains, and objects are a human rights concern shared by all.

This policy also recognizes the unique legal relationship between the federal government and tribal governments as set forth in the Constitution of the United States, treaties, statutes and court decisions, and acknowledges that, frequently, the remains encountered in Section 106 review are of significance to Indian tribes.

Section 106 requires agencies to seek agreement with consulting parties on measures to avoid, minimize, or mitigate adverse effects to historic properties. Accordingly, and consistent with Section 106, this policy does not recommend a specific outcome from the consultation process. Rather, it focuses on issues and perspectives that federal agencies ought to consider when making their Section 106 decisions. In many cases, federal agencies will be bound by other applicable federal, tribal, state, or local laws that do prescribe a specific outcome, such as the Native American Graves Protection and Repatriation Act (NAGPRA). The federal agency must identify and follow applicable laws and implement any prescribed outcomes.

For undertakings on federal and tribal land that encounter Native American or Native Hawaiian human remains and funerary objects, NAGPRA applies. NHPA and NAGPRA are separate and distinct laws, with separate and distinct implementing regulations and categories of parties that must be consulted.[1] Compliance with one of these laws does not mean or equal compliance with the other. Implementation of this policy and its principles does not, in any way, change, modify, detract or add to NAGPRA or other applicable laws.

Principles: When burial sites, human remains, or funerary objects will be or are likely to be encountered in the course of Section 106 review, a federal agency should adhere to the following principles:

Principle 1: Participants in the Section 106 process should treat all burial sites, human remains and funerary objects with dignity and respect.

Principle 2: Only through consultation, which is the early and meaningful exchange of information, can a federal agency make an informed and defensible decision about the treatment of burial sites, human remains, and funerary objects.

Principle 3: Native Americans are descendants of original occupants of this country. Accordingly, in making decisions, federal agencies should be informed by and utilize the special expertise of Indian tribes and Native Hawaiian organizations in the documentation and treatment of their ancestors.

Principle 4: Burial sites, human remains and funerary objects should not be knowingly disturbed unless absolutely necessary, and only after the federal agency has consulted and fully considered avoidance of impact and whether it is feasible to preserve them in place.

Principle 5: When human remains or funerary objects must be disinterred, they should be removed carefully, respectfully, and in a manner developed in consultation.

Principle 6: The federal agency is ultimately responsible for making decisions regarding avoidance of impact to or treatment of burial sites, human remains, and funerary objects. In reaching its decisions, the federal agency must comply with applicable federal, tribal, state, or local laws.

Principle 7: Through consultation, federal agencies should develop and implement plans for the treatment of burial sites, human remains, and funerary objects that may be inadvertently discovered.

Principle 8: In cases where the disposition of human remains and funerary objects is not legally prescribed, federal agencies should proceed following a hierarchy that begins with the rights of lineal descendants, and if none, then the descendant community, which may include Indian tribes and Native Hawaiian organizations.

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[1] The ACHP's publication *Consulting with Indian Tribes in the Section 106 Process* and the National Association of Tribal Historic Preservation Officers' publication *Tribal Consultation: Best Practices in Historic Preservation* provide additional guidance on this matter.

DISCUSSION:

Principle 1: Participants in the Section 106 process should treat all burial sites, human remains and funerary objects with dignity and respect.

Because the presence of human remains and funerary objects gives a historic property special importance as a burial site or cemetery, federal agencies need to consider fully the values associated with such sites. When working with human remains, the federal agency should maintain an appropriate deference for the dead and the funerary objects associated with them, and demonstrate respect for the customs and beliefs of those who may be descended from them.

Through consultation with descendants, culturally affiliated groups, descendant communities, and other parties, federal agencies should discuss and reach agreement on what constitutes respectful treatment.

Principle 2: Only through consultation, which is the early and meaningful exchange of information, can a federal agency make an informed and defensible decision about the treatment of burial sites, human remains, and funerary objects.

Consultation is the hallmark of the Section 106 process. Federal agencies must make a "reasonable and good faith" effort to identify consulting parties and begin consultation early in project planning, after the federal agency determines it has an undertaking and prior to making decisions about project design, location, or scope.

The NHPA, the ACHP's regulations, and Presidential Executive Orders set out basic steps, standards, and criteria in the consultation process, including:

- Federal agencies have an obligation to seek out all consulting parties [36 CFR § 800.2(a)(4)], including the State Historic Preservation Officer (SHPO)/Tribal Historic Preservation Officer (THPO) [36 CFR § 800.3(c)].

- Federal agencies must acknowledge the sovereign status of Indian tribes [36 CFR § 800.2(c)(2)(ii)]. Federal agencies are required to consult with Indian tribes on a government-to-government basis in recognition of the unique legal relationship between federal and tribal governments, as set forth in the Constitution of the United States, treaties, statutes, court decisions, and executive orders and memoranda.

- Consultation on a government-to-government level with Indian tribes cannot be delegated to non-federal entities, such as applicants and contractors.

- Federal agencies should solicit tribal views in a manner that is sensitive to the governmental structures of the tribes, recognizing their desire to keep certain kinds of information confidential, and that tribal lines of communication may argue for federal agencies to provide extra time for the exchange of information.

- Properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined eligible for inclusion on the National Register [16 U.S.C. § 470a(d)(6)(A)], and federal agencies must consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to such historic properties [16 U.S.C. § 470a(d)(6)(B) and 36 CFR § 800.2(c)(2)(ii)(D)].

Principle 3: Native Americans are descendants of original occupants of this country. Accordingly, in making decisions, federal agencies should be informed by and utilize the special expertise of Indian tribes and Native Hawaiian organizations in the documentation and treatment of their ancestors.

This principle reiterates existing legal requirements found in federal law, regulation and executive orders, and is consistent with positions that the ACHP has taken over the years to facilitate enfranchisement and promote broad participation in the Section 106 process. Federal agencies must consult with Indian tribes on a government-to-government basis because they are sovereign nations.

Indian tribes and Native Hawaiian organizations bring a special perspective on how a property possesses religious and cultural significance to them. Accordingly, federal agencies should utilize their expertise about, and religious and cultural connection to, burial sites, human remains, and associated funerary objects to inform decision-making in the Section 106 process.

Principle 4: Burial sites, human remains and funerary objects should not be knowingly disturbed unless absolutely necessary, and only after the federal agency has consulted and fully considered avoidance of impact and whether it is feasible to preserve them in place.

As a matter of practice, federal agencies should avoid impacting burial sites, human remains, and funerary objects as they carry out their undertakings. If impact to the burial site can be avoided, this policy does not compel federal agencies to remove human remains or funerary objects just so they can be documented.

As this policy advocates, federal agencies should always plan to avoid burial sites, human remains, and funerary objects altogether. When a federal agency determines, based on consultation with Section 106 participants, that avoidance of impact is not appropriate, the agency should minimize disturbance to such sites, remains, and objects. Accordingly, removal of human remains or funerary objects should occur only when other alternatives have been considered and rejected.

When a federal agency determines, based on consultation with Section 106 participants, that avoidance of impact is not appropriate, the agency should then consider any active steps it may take to preserve the burial site in place, perhaps through the intentional covering of the affected area, placement of markers, or granting of restrictive or other legal protections. In many cases, preservation in place may mean that, to the extent allowed by law, the locations of burial sites, human remains, and funerary objects should not be disclosed publicly. Alternatively and consistent with the Section 106 regulations [36 CFR § 800.5(a)(2)(vi)], natural deterioration of the remains may be the acceptable or preferred outcome of the consultation process.

Principle 5: When human remains or funerary objects must be disinterred, they should be removed carefully, respectfully, and in a manner developed in consultation.

When the federal agency decides that human remains or funerary objects must be disturbed, they should be removed respectfully and dealt with according to the plan developed by the federal agency in consultation. "Careful" disinterment means that those doing the work should have, or be supervised by people having, appropriate expertise in techniques for recognizing and disinterring human remains.

This policy does not endorse any specific treatment. However, federal agencies must make a reasonable and good faith effort to seek agreement through consultation before making its decision about how human remains and/or funerary objects shall be treated.

The plan for the disinterment and treatment of human remains and/or funerary objects should be negotiated by the federal agency during consultation on a case-by-case basis. However, the plan should provide for an accurate accounting of federal implementation. Depending on agreements reached through the Section 106 consultation process, disinterment may or may not include field recordation. In some instances, such recordation may be so abhorrent to consulting parties that the federal agency may decide it is inappropriate to carry it out. When dealing with Indian tribes, the federal agency must comply with its legal responsibilities regarding tribal consultation, including government-to-government and trust responsibilities, before concluding that human remains or funerary objects must be disinterred.

Principle 6: The federal agency is ultimately responsible for making decisions regarding avoidance of impact to or treatment of burial sites, human remains, and funerary objects. In reaching its decisions, the federal agency must comply with applicable federal, tribal, state, or local laws.

Federal agencies are responsible for making final decisions in the Section 106 process [36 CFR § 800.2(a)]. The consultation and documentation that are appropriate and necessary to inform and support federal agency decisions in the Section 106 process are set forth in the ACHP's regulations [36 CFR Part 800].

Other laws, however, may affect federal decision-making regarding the treatment of burial sites human remains, and funerary objects. Undertakings located on federal or tribal lands, for example, are subject to the provisions of NAGPRA and the Archaeological Resources Protection Act (ARPA). When burial sites, human remains, or funerary objects are encountered on state and private lands, federal agencies must identify and follow state law when it applies. Section 106 agreement documents should take into account the requirements of any of these applicable laws.

Principle 7: Through consultation, federal agencies should develop and implement plans for the treatment of burial sites, human remains, and funerary objects that may be inadvertently discovered.

Encountering burial sites, human remains, or funerary objects during the initial efforts to identify historic properties is not unheard of. Accordingly, the federal agency must determine the scope of the identification effort in consultation with the SHPO/THPO, Indian tribes and Native Hawaiian organizations, and others before any archaeological testing has begun [36 CFR § 800.4(a)] to ensure the full consideration of avoidance of impact to burial sites, human remains, and funerary objects.

The ACHP's regulations provide federal agencies with the preferred option of reaching an agreement ahead of time to govern the actions to be taken when historic properties are discovered during the implementation of an undertaking. In the absence of prior planning, when the undertaking has been approved and construction has begun, the ACHP's post-review discovery provision [36 CFR § 800.13] requires the federal agency to carry out several actions:

(1) make reasonable efforts to avoid, minimize, or mitigate adverse effects to such discovered historic properties;
(2) notify consulting parties (including Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to the affected property) and the ACHP within 48 hours of the agency's proposed course of action;
(3) take into account the recommendations received; and then
(4) carry out appropriate actions.

NAGPRA prescribes a specific course of action when Native American and Native Hawaiian human remains and funerary objects are discovered on federal or tribal lands in the absence of a plan—cessation of the activity, protection of the material, notification of various parties, consultation on a course of action and its implementation, and then continuation of the activity. However, adherence to the plan under Principle 5 would cause new discoveries to be considered "intentional excavations" under NAGPRA because a plan has already been developed, and can be immediately implemented. Agencies then could avoid the otherwise mandated 30 day cessation of work for "inadvertent discoveries."

Principle 8: In cases where the disposition of human remains and funerary objects is not legally prescribed, federal agencies should proceed following a hierarchy that begins with the rights of lineal descendants, and if none, then the descendant community, which may include Indian tribes and Native Hawaiian organizations.

Under the ACHP's regulations, "descendants" are not identified as consulting parties by right. However, federal agencies shall consult with Indian tribes and Native Hawaiian organizations that attach religious and cultural significance to burial sites, human remains and associated funerary objects, and be cognizant of their expertise in, and religious and cultural connection to, them. In addition, federal agencies should recognize a biological or cultural relationship and invite that individual or community to be a consulting party [36 CFR § 800.3(f)(3)].

When federal or state law does not direct disposition of human remains or funerary objects, or when there is disagreement among claimants, the process set out in NAGPRA may be instructive. In NAGPRA, the "ownership or control" of human remains and associated funerary objects lies with the following in descending order: specific lineal descendants; then tribe on whose tribal lands the items were discovered; then tribe with the closest cultural affiliation; and then tribe aboriginally occupying the land, or with the closest "cultural relationship" to the material.

Definitions Used for the Principles

- **Burial Site**: Any natural or prepared physical location, whether originally below, on, or above the surface of the earth, into which as a part of the death rite or ceremony of a culture, individual human remains are deposited [25 U.S.C. 3001.2(1)].
- **Consultation:** 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 review process [36 CFR § 800.16(f)].
- **Consulting parties:** Persons or groups the federal agency consults with during the Section 106 process. They may include the State Historic Preservation Officer; the Tribal Historic Preservation Officer; Indian tribes and Native Hawaiian organizations; representatives of local governments; applicants for federal assistance, permits, licenses, and other approvals; and/or any additional consulting parties [based on 36 CFR § 800.2(c)]. Additional consulting parties may include individuals and organizations with a demonstrated interest in the undertaking due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking's effects on historic properties [36 CFR § 800.2(c)(6)].
- **Disturbance:** Disturbance of burial sites that are listed in or eligible for listing in the National Register of Historic Places will constitute an adverse effect under Section 106. An adverse effect occurs when "an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, setting, materials, workmanship, feeling, or association" [36 CFR § 800.5(a)(1)].
- **Federal land:** Lands under a federal agency's control. Mere federal funding or permitting of a project does not turn an otherwise non-federal land into federal land (see *Abenaki Nation of Mississquoi* v. *Hughes*, 805 F. Supp. 234 (D. Vt. 1992), aff'd, 990 F. 2d 729 (2d Cir. 1993) (where the court found that a Clean Water Act permit issued by the US Army Corps of Engineers did not place the relevant land under federal "control" for NAGPRA purposes).
- **Funerary objects:** "items that, as part of the death rite or ceremony of a culture, are reasonably believed to have been placed intentionally at the time of death or later with or near individual human remains" [25 U.S.C. 3001(3)(B)].
- **Historic property:** "Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. It includes artifacts, records, and remains that are related to and located within such properties, and it includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register of Historic Places criteria" [36 CFR § 800.16(1)].
- **Human remains:** The physical remains of a human body. The term does not include remains or portions of remains that may reasonably be determined to have been freely given or naturally shed by the individual from whose body they were obtained, such as hair made into ropes or nets [see 43 CFR § 10.2(d)(1)].
- **Indian Tribe**: "An Indian tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation or Village Corporation, as those terms are defined in Section 3 of the Alaska Native Claims Settlement Act [43 U.S.C. 1602], which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians" [36 CFR § 800.16(m)].
- **Native American:** Of, or relating to, a tribe, people, or culture that is indigenous to the United States [25 U.S.C. 3001 (9)]. Of, or relating to, a tribe, people, or culture indigenous to the Unites States, including Alaska and Hawaii [43 CFR 10.2(d)].

- **Native Hawaiian:** Any individual who is a descendant of the aboriginal people who, prior to 1778, occupied and exercised sovereignty in the area that now constitutes the state of Hawaii [36 CFR § 800.16(s)(2)].
- **Native Hawaiian Organization:** Any organization which serves and represents the interests of Native Hawaiians; has as a primary and stated purpose the provision of services to Native Hawaiians; and has demonstrated expertise in aspects of historic preservation that are significant to Native Hawaiians [36 CFR § 800.16(s)].
- **Policy statement:** A formal statement, endorsed by the full ACHP membership, representing the membership's collective thinking about what to consider in reaching decisions about select issues, in this case, human remains and funerary objects encountered in undertakings on federal, tribal, state, or private lands. Such statements do not have the binding force of law.
- **Preservation in place:** Taking active steps to ensure the preservation of a property.
- **Protection of Historic Properties**: Regulations [36 CFR Part 800] implementing Section 106 of the National Historic Preservation Act.
- **Section 106**: That part of the National Historic Preservation Act which establishes a federal responsibility to take into account the effects of undertakings on historic properties and to provide the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such action.
- **State Historic Preservation Officer:** The official appointed or designated pursuant to Section 101(b)(1) of NHPA to administer the state historic preservation program.
- **Tribal Historic Preservation Officer**: The official appointed by the tribe's chief governing authority or designated by a tribal ordinance or preservation program who has assumed the responsibilities of the SHPO for purposes of Section 106 compliance on tribal lands in accordance with Section 101(d)(2) of NHPA.
- **Treatment:** Under Section 106, "treatments" are measures developed and implemented through Section 106 agreement documents to avoid, minimize, or mitigate adverse effects to historic properties.

Acronyms Used for the Policy Statement
- **ACHP**: Advisory Council on Historic Preservation.
- **ARPA**: Archaeological Resources Protection Act [16 U.S.C. 470aa-mm].
- **NHPA**: National Historic Preservation Act [16 U.S.C. § 470f].
- **NAGPRA**: The Native American Graves Protection and Repatriation Act [25 U.S.C. 3001 et seq].
- **SHPO**: State Historic Preservation Officer
- **THPO**: Tribal Historic Preservation Officer

[The members of the Advisory Council on Historic Preservation unanimously adopted this policy on February 23, 2007]

ATTACHMENT 29 – UNANTICIPATED DISCOVERIES PLAN FOR SUBMERGED ARCHAEOLOGICAL SITES, HISTORIC PROPERTIES, AND CULTURAL RESOURCES INCLUDING HUMAN REMAINS: REVOLUTION WIND FARM FOR LEASE AREA OCS A-0486 CONSTRUCTION AND OPERATIONS PLAN

[Insert ATTACHMENT 29 – REVOLUTION WIND MARINE UNANTICIPATED DISCOVERY PLAN]

UNANTICIPATED DISCOVERIES PLAN FOR SUBMERGED ARCHAEOLOGICAL SITES, HISTORIC PROPERTIES, AND CULTURAL RESOURCES INCLUDING HUMAN REMAINS, REVOLUTION WIND FARM FOR LEASE AREA OCS A-0486 CONSTRUCTION AND OPERATIONS PLAN

PREPARED FOR

REVOLUTION WIND LLC **56 EXCHANGE TERRACE** **SUITE 300** **PROVIDENCE, RI 02903**	AND	**VHB ENGINEERING** **99 HIGH ST # 10** **BOSTON, MA 02110**

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SEARCH

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JULY 2022

INTRODUCTION

Revolution Wind LLC (Revolution Wind) proposes to construct and operate the Revolution Wind Farm Project (Project) within the Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS A-0486 (Lease Area). The Project consists of the Revolution Wind Farm (RWF) and the Revolution Wind Farm Export Cable (RWEC) route, which traverses federal and state waters. The RWEC has a proposed landfall near Quonset Point in North Kingstown, Rhode Island. Revolution Wind has submitted a Construction and Operations Plan (COP) for the Project to BOEM to support the development, operation, and eventual decommissioning of Project infrastructure, including offshore wind turbines, offshore substations, array cables, substation interconnector cables, and offshore export cables. SEARCH provided technical expertise to Revolution Wind's environmental consultant, VHB Engineering (VHB), by providing a Qualified Marine Archaeologist (QMA) in accordance with Lease Agreement Stipulation Addendum C Section 2.1.1.2.

SEARCH developed this Unanticipated Discoveries Plan (UDP) to assist Revolution Wind and its contractors to preserve and protect potential cultural resources from adverse impacts caused by Project construction, operation and maintenance, and decommissioning activities. The UDP sets forth guidelines and procedures to be used in the event potential submerged cultural resource are encountered during bottom disturbing activities and assists Revolution Wind in its compliance with Section 106 of the National Historic Preservation Act (NHPA) (Title 54 U.S.C. § 306108), Native American Graves Protection and Repatriation Act (Title 25 U.S.C. § 3001 et seg.), Lease OCS A-0486 Lease Stipulations, and other relevant state and local laws as applicable. This UDP is subject to revisions based on consultations with interested parties pursuant to Section 106 of the National Historic Preservation Act or the Act's implementing regulations at 36 CFR Part 800.

ROLES AND RESPONSIBILITIES

Implementation of the provisions and procedures in the UDP will require the coordinated efforts of Revolution Wind and their contractors during all construction, operations and maintenance, and decommissioning activities with the potential to impact the seafloor. The following sections identify key participants in the UDP and outlines their roles and responsibilities.

REVOLUTION WIND

Implementation of the provisions and procedures outlined in this plan is ultimately the responsibility of Revolution Wind or its designee, who will be responsible for the following:

- Ensuring procedures and policies outlined in the UDP and UDP training materials are implemented;
- Identifying a responsible party within Revolution Wind tasked with overseeing implementation of the UDP during all project and contractor activities;
- Developing cultural resource and UDP awareness training programs for all project staff and contractors;
- Requiring all project and contractor staff complete cultural resource and UDP awareness training;
- Coordinating and facilitating communication between the QMA, project staff, and contractors if a potential cultural resource is encountered during project activities; and
- Participating in and/or facilitating consultations with state and federal agencies (BOEM, Naval History and Heritage Command [NHHC], Rhode Island Historical Preservation & Heritage Commission [RIHPHC], etc…), federally recognized Tribes'/Tribal Nations' Tribal Historic Preservation Offices (THPOs), and other consulting parties, as appropriate.

QUALIFIED MARINE ARCHAEOLOGIST

Revolution Wind will retain the services of a QMA to provide cultural resource advisory services during implementation of the UDP. The QMA will be responsible for the following:

- Assist Revolution Wind with the development and implementation of the procedures outlined in the UDP;
- Assist Revolution Wind in developing a cultural resource and UDP awareness training program and informational graphic;
- Review and document potential submerged cultural resources identified by the project and/or contractor staff;

- Assist Revolution Wind with the Section 106 consultation process that may arise as a result of an unanticipated submerged cultural resource; and
- Conduct archaeological investigation of unanticipated submerged cultural resources following coordination with appropriate consulting parties.

TRAINING AND ORIENTATION

As described in the previous section, Revolution Wind will be responsible for ensuring Project and contractor staff complete a cultural resources and UDP awareness training program prior to the start of bottom disturbing activities. The training will be sufficient to allow Project and contractor staff to identify common types of marine cultural resources and implement the UDP procedures. The training will be delivered as a standalone training and/or combined with the Project's or contractors' general health and safety (H&S) or environment, health, and safety (EHS) induction training.

The training program will include, but not be limited to, the following elements:

- A review of applicable state and federal cultural resource laws and regulations;
- Characteristics of common types of submerged cultural resources found on the Atlantic Outer Continental Shelf (e.g. wooden shipwrecks, metal shipwrecks, downed aircraft, post-Contact artifacts, pre-Contact artifacts, bone and faunal remains, etc.);
- How to identify potential submerged cultural resources during bottom disturbing activities; and
- Procedures to follow and parties to notify if potential submerged cultural resources/materials are encountered during project activities.

The SEARCH QMA will develop draft cultural resources and UDP awareness training in coordination with Revolution Wind. The training program will be provided to BOEM and the RIHPhC for review and comment before the training program is finalized.

In additional to the training program, the SEARCH QMA will generate an informational graphic summarizing the UDP and the materials discussed in the cultural resources and UDP awareness training program. The informational graphic will include:

- Images of common types of submerged cultural resources and materials;
- A flow chart depicting the UDP reporting process;
- A notice to all employees of their stop work authority if potential cultural resources are encountered; and
- Contact information for the Revolution Wind staff responsible for overseeing implementation of the UDP and the QMA.

The informational graphic will be placed in a conspicuous location on each project and contractor vessel where workers can see it and copies will be made available to project and/or contractor staff upon request.

PROCEDURES WHEN CULTURAL MATERIAL ARE OBSERVED

As part of its COP submission, Revolution Wind conducted an extensive marine archaeological resources assessment (MARA) of the Project's preliminary area of potential effects (PAPE). The MARA identified 19 potential submerged cultural resources (Targets 01-19) and 8 geomorphic features of archaeological interest (Targets 20-28) within the PAPE. Revolution Wind anticipates avoidance of Targets 01-19 and their associated recommended avoidance buffers. Additionally, as the final design is not known, the degree of adverse effects to Targets 20-28 is currently unknown. Revolution Wind is developing a Mitigation Framework to aid in avoiding, minimizing, and/or mitigating adverse effects upon historic properties.

Even with the extensive preconstruction marine archaeological surveys, it is impossible to ensure that all cultural resources have been identified within the PAPE. Even at sites that have been previously identified and assessed, there is a potential for the discovery of previously unidentified archaeological components, features, or human remains that may require investigation and assessment. Furthermore, identified historic properties may sustain effects that were not originally anticipated. Therefore, a procedure has been developed for the treatment of unanticipated discoveries that may occur during site development.

The procedure also will be implemented should an unanticipated archaeological find occur during investigations to ground-truth potential unexploded ordnance (pUXO). In addition, Revolution Wind will involve the QMA during pUXO investigations to consult and monitor. Revolution Wind has agreed to a protocol for inspections that includes a decision tree for contacting the QMA; providing the QMA with inspection reports, including video footage, still photographs, multibeam echosounder imagery, and pUXO specialist observations; and real-time video monitoring for inspections that occur atop shallowly buried geomorphic features of archaeological interest.

The implementation of the final UDP will be overseen by Revolution Wind and a QMA who meets or exceeds the Secretary of the Interior's *Professional Qualifications Standards for Archaeology* [48 FR 44738-44739] and has experience in conducting HRG surveys and processing and interpreting data for archaeological potential [BOEM 2020]. See **Figure 1** for a flow chart of the communications and notification plan for unanticipated discoveries.

If unanticipated submerged cultural resources are discovered, the following steps should be taken:

(1) Per Lease Stipulation 4.2.7.1, all bottom-disturbing activities in the immediate area of the discovery shall cease and every effort will be made to avoid or minimize impacts to the potential submerged cultural resource(s).
(2) The project or contractor staff will immediately notify Revolution Wind of the discovery.
(3) Revolution Wind will notify the QMA and provide them with sufficient information/documentation on the potential find to allow the QMA to evaluate the discovery and determine if the find is a cultural resource. If necessary, the QMA may request to visit the find site or the vessel that recovered the cultural material to inspect

the find. If the find is a cultural resource, the QMA will provide a preliminary assessment as to its potential to be a historic property as defined in 36 CFR Part 800.

(4) Per Lease Stipulation 4.2.7.1, BOEM shall be notified of the potential submerged cultural resource within 24 hours of the discovery. Revolution Wind shall also notify the State Historic Preservation Officer (SHPO) of Rhode Island and/or Massachusetts, the State Archaeologist(s), and the Tribal Historic Preservation Officers (THPOs) or other designated representatives of the consulting tribal governments. If the potential submerged cultural resource could be a sunken military craft under the jurisdiction of the Department of the Navy, then Revolution Wind additionally will notify the NHHC.

(5) Within 72 hours of being notified of the discovery, Revolution Wind shall issue a report in writing to BOEM providing available information concerning the nature and condition of the potential submerged cultural resource and observed attributes relevant to the resource's potential eligibility for listing in the National Register of Historic Places (NRHP).

(6) Revolution Wind shall consult with BOEM, as feasible, to obtain technical advice and guidance for the evaluation of the discovered cultural resource.

(7) If the impacted resource is determined by BOEM, in consultation with the NHHC if applicable to a sunken military craft, to be NRHP eligible, a mitigation plan shall be prepared by Revolution Wind for the discovered cultural resource. This plan must be reviewed by BOEM prior to submission to the RI/MA SHPO and representatives from consulting federally recognized Tribes/Tribal Nations for their review and comment, as well as provided to the NHHC for review and approval if the potential cultural resource falls under the jurisdiction of the Department of the Navy. The RI/MA SHPO and Tribes/Tribal Nations will review the plan and provide comments and recommendations within one week, with final comments to follow as quickly as possible.

(8) Per Lease Stipulation 4.2.6, Revolution Wind may not impact a known archaeological resource in federal waters without prior approval from BOEM. If the potential resource falls under the jurisdiction of the Department of the Navy, then similar approval will be provided from the NHHC. No development activities in the vicinity of the cultural resource will resume until either a mitigation plan is executed or, if BOEM, or the NHHC if applicable, determines a mitigation plan is not warranted, BOEM provides written approval to Revolution Wind to resume bottom disturbing activities. For discoveries in state waters, Revolution Wind will not impact a known archaeological resource with prior approval from BOEM and the RI/MA SHPO.

If suspected human remains are encountered, the below procedures, which comply with the Advisory Council on Historic Preservation's (ACHP) *Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects*, should be followed.

(1) All work in the near vicinity of the human remains shall cease and reasonable efforts should be made to avoid and protect the remains from additional impact. Encountered potential material shall be protected, which may include keeping the remains submerged in an onboard tank of sea water or other appropriate material.

(2) The Onboard Representative shall immediately notify the County Medical Examiner, State Archaeologist, the Forensic Anthropology Unit of the Rhode Island State Police, and Revolution Wind as to the findings.

(3) Revolution Wind will notify the QMA and provide them with sufficient information/documentation on the potential find to allow the QMA to evaluate the discovery and determine if the find is a cultural resource. If necessary, the QMA may request to visit the vessel to inspect the potential human remains. If the find is a cultural resource, the QMA will provide a preliminary assessment. The QMA will document and inventory the remains and any associated artifacts, and assist in coordinating with federal, state, and local officials.

(4) A plan for the avoidance of any further impact to the human remains and/or mitigative excavation, reinternment, or a combination of these treatments will be developed in consultation with the State Archaeologist; the RI/MA SHPO; BOEM; the NHHC, if the potential human remains could be associated with a sunken military craft under the jurisdiction of the Department of the Navy; and appropriate Tribes or closest lineal descendants. All parties will be expected to respond with advice and guidance in an efficient time frame. Once the plan is agreed to by all parties, the plan will be implemented.

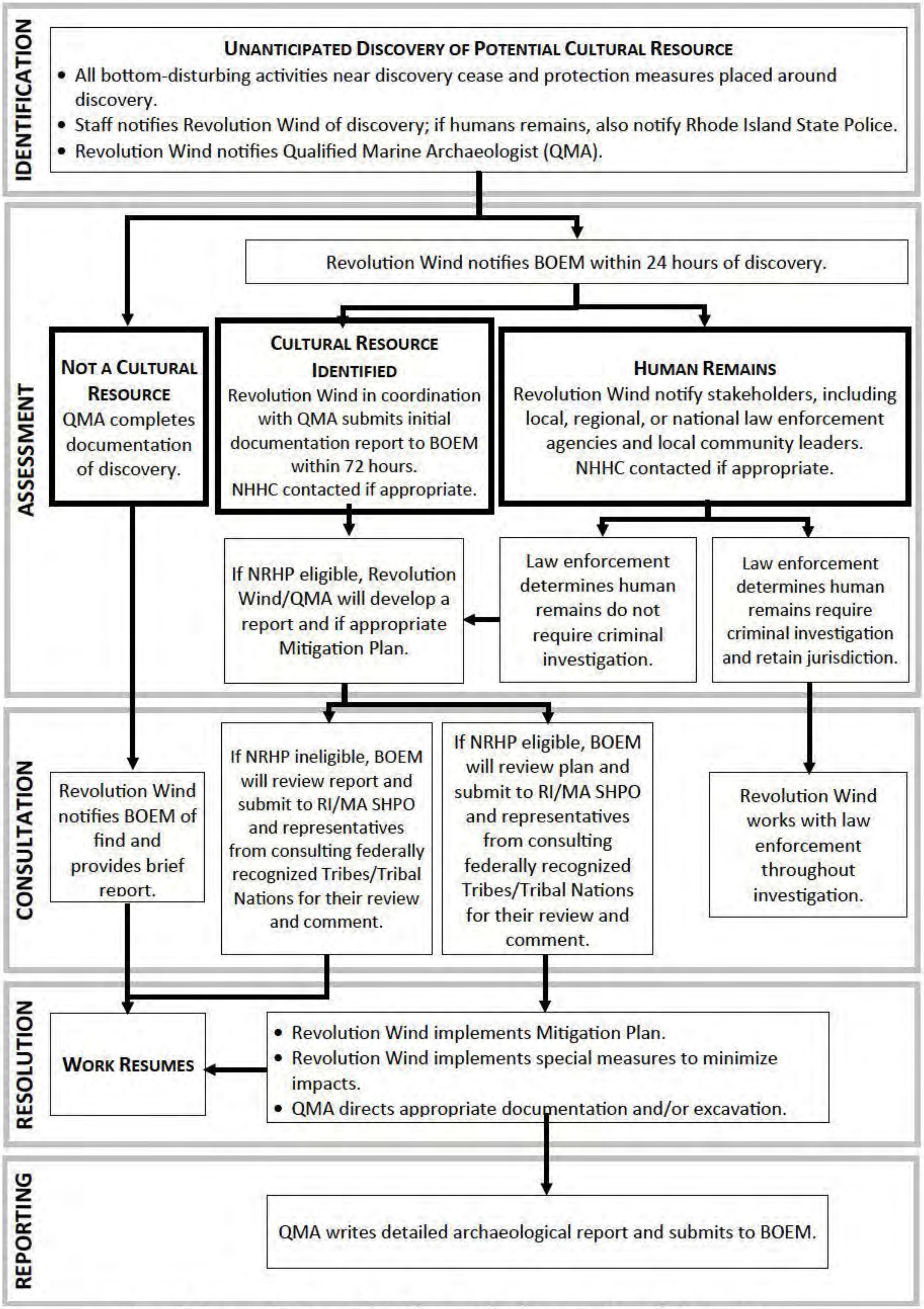

Figure 1. Communications and notification plan for unanticipated discoveries.

ARCHAEOLOGICAL INVESTIGATION OF A SUBMERGED UNANTICIPATED DISCOVERY

Archaeological investigation of a submerged unanticipated discovery may be necessary in order to evaluate the find, determine its eligibility for listing in the NRHP, and/or assess any construction impacts that may have occurred. The following is a recommended procedure for complying with the UDP and providing BOEM; NHHC, if applicable; and RI/MA SHPO with the necessary information to make informed decisions to approve continuation of bottom disturbing activities. After each step, consultation among the appropriate parties will occur.

(1) Initial assessment of unanticipated discovery via a refined HRG survey and/or ROV investigation (Phase Ia reconnaissance survey).
    a. May result in no further recommended action (i.e., target is not a historic property) or additional investigation.
(2) Develop an avoidance zone based upon Step 1.
    a. Minimally, construction activity will remain outside of the avoidance zone for a period of time necessary to allow archaeological investigation, if required.
    b. Determine whether construction activity can remain outside of the avoidance zone permanently.
(3) Identify the source, delineate the site boundary, and assess potential impacts that led to the unanticipated discovery (Phase Ib identification).
    a. Accomplished utilizing archaeological/scientific diving and/or ROV investigation.
    b. May result in no further recommended action (i.e., target is not a historic property) or additional investigation.
(4) Determine eligibility for listing in the NRHP (Phase II NRHP evaluation).
    a. Accomplished utilizing archaeological/scientific diving.
    b. May require extensive excavation.
    c. May require archival research.
(5) Develop a strategy to resolve adverse effects to the historic property that occurred as a result of the unanticipated discovery and to minimize or mitigate potential future adverse effects as construction proceeds.
(6) On-site monitoring of bottom disturbing activities at the location.

Not all of these steps may be necessary, and the appropriate course of action will be determined at the time of discovery and in consultation with BOEM and if applicable, RI/MA SHPO.

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2007 *Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects*.https://www.achp.gov/sites/default/files/policies/2018-06/ACHPPolicyStatementRegardingTreatmentofBurialSitesHumanRemainsandFuneraryObjects0207.pdf, Digital article accessed December 9, 2021.

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2020 *Guidelines for Providing Archaeological and Historical Property Information Pursuant to 30 CFR Part 585.* United States Department of the Interior, Office of Renewable Energy Programs.

APPENDIX K

Supplemental Information on Alternatives Development

Contents

Figures

Introduction

The Bureau of Ocean Energy Management (BOEM) considered alternatives to the Proposed Action that were identified through coordination with cooperating and participating agencies and through public comments received during the public scoping period for the environmental impact statement (EIS). BOEM evaluated the alternatives and excluded from further consideration alternatives that did not meet the purpose and need, did not meet the screening criteria, or both. The screening criteria are presented below. Alternatives that were considered and carried forward for detailed analysis are presented in Section 2.1, Alternatives, of the EIS, and alternatives excluded from further consideration are presented in Section 2.1.7, Alternatives Considered but Dismissed from Detailed Analysis.

The sections below provide more detail on BOEM's screening criteria followed by additional background on the evolution of the layouts carried forward for Alternatives C1, C2, E1, and E2.

Alternatives Screening Criteria

BOEM applied rule of reason in identifying reasonable alternatives that are both technically and economically feasible and meet the purpose and need of the Proposed Action. An alternative was considered but not analyzed in detail if it met any of the following criteria:

- It is outside the jurisdiction of the lead agency,[1] including resulting in activities that are not allowed under the lease (e.g., requiring locating part or all of the wind energy facility outside of the Lease Area or constructing and operating a facility for another form of energy).
- It would not respond to the purpose and need of BOEM's action, including not furthering the United States' policy to make Outer Continental Shelf energy resources available for expeditious and orderly development, subject to environmental safeguards (43 USC 1332(3).
- It would require a major change to an existing law, regulation, or policy.
- It would not be responsive to the applicant's goals, lease constraints, and obligations, such as alternatives that would
    - partially or completely relocate the Project outside of the defined geographic area where it was proposed; or
    - result in the development of the Project that would not allow the developer to satisfy contractual obligations (e.g., resulting in the Project having a nameplate capacity that is less than what is required under a power purchase agreement (PPA); or
    - result in significant implementation delays that would prevent the Project from initiating commercial operations by the contractually required date in the PPA).[2]

[1] "Include reasonable alternatives not within the jurisdiction of the lead agency" was removed with the Council on Environmental Quality's updated NEPA-implementing regulations. See 43304 *Federal Register* 85, July 16, 2020.

[2] Where present, meeting an offtake agreement(s) is the primary goal of the applicant's proposal. Offtake agreements (in the case of Revolution Wind, the three PPA agreements) are also unlike other private agreements between two for-profit entities involved in an offshore wind project. 1) The offtake agreement is the primary (and often sole) source of revenue for a project. Offshore wind projects will not obtain financing for the capital investment needed for construction without an offtake agreement. This

- It is technically infeasible, meaning implementation of the alternative is unlikely given past and current practice, technology (e.g., experimental turbine design or foundation type), or site conditions (e.g., presence of boulders), as determined by BOEM's technical experts.
- It is economically infeasible, meaning implementation of the alternative is unlikely due to unreasonable costs as determined by BOEM's technical experts; although this does not require cost-benefit analysis or speculation about an applicant's costs and profits, there must be a reasonable basis.
- It cannot be analyzed because its implementation is remote or speculative, or it is too conceptual in that it lacks sufficient detail to meaningfully analyze impacts.
- It is substantially similar in design to an alternative that is or will be analyzed in detail.
- It is environmentally infeasible, meaning implementation of the alternative would not be allowed by another agency from which a permit or approval is required, or implementation results in an obvious and substantial increase in impacts on the human environment.

Alternative C: Habitat Impact Minimization Alternative (Habitat Alternative)

The Revolution Wind Renewable Energy Lease OCS-A 0486 (Lease Area), partially located on Cox Ledge, is dominated by complex benthic habitats, with large contiguous areas of complex habitats located centrally and throughout the entire southern portion of the Lease Area. Smaller, patchy areas of complex habitats also occur throughout the northern portion of the Lease Area (see Appendix X2 [Inspire Environmental 2021] in the *Construction and Operations Plan Revolution Wind Farm* [COP] [vhb 2022] for the benthic habitat mapping report).

BOEM received scoping comments from the U.S. Environmental Protection Agency (EPA), the New England and Mid-Atlantic Fisheries Management Councils, the Defenders of Wildlife, the Nature Conservancy, and the National Marine Fisheries Service (NMFS) that supported the creation of an EIS alternative focused on reducing impacts to complex benthic habitat that may support important commercial and recreational fisheries species in the Lease Area (SWCA Environmental Consultants n.d. [2021]). Some of these comments specifically cited the importance of Cox Ledge and surrounding complex habitat areas for Atlantic cod (*Gadus morhua*) spawning and survival of juvenile cod. The extensive boulders and cobbles in the area also provide habitat for other structure-oriented fish species, such as black sea bass (*Centropristis striata*).

makes the offtake agreement central to the economic feasibility of a project. 2) Offtake agreements are often the result of years of work by states and/or regional/local utilities that may include competitive award processes; are often the result of coordination with a regional independent system operator regarding point of interconnection and the capacity constraints therein; and are subject to considerable regulations regarding electricity pricing, interconnection requirements, and public interest considerations. BOEM finds that the unique position of these 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 in detail only those alternatives that would allow lessees to meet the obligations under their offtake agreements.

Micrositing,[3] in which the installation location of a WTG foundation is altered slightly from the proposed location to avoid sensitive habitat or seabed hazards, allows for the reduction of impacts to complex habitats at some WTG locations. However, given the density of complex habitats throughout the Lease Area, it would not be feasible to fully avoid impacts to these habitats and meet the existing PPAs with the largest turbine size considered in the project design envelope (PDE). Therefore, Alternative C considers and prioritizes contiguous areas of complex habitat that should be excluded from development to avoid and minimize impacts to complex habitats to the greatest extent possible while meeting BOEM's purpose and need. Alternative C seeks to reduce impacts to sensitive benthic habitats within the Lease Area that are most vulnerable to permanent and long-term impacts from the Proposed Action. The number of WTGs that could be removed in Alternative C is based on the minimum power output for Revolution Wind (704 megawatts [MW]) using the largest capacity WTG in the PDE (12 MW). BOEM determined a maximum of 36 WTG locations could be eliminated from the proposed 100 locations, which includes a minimum of five "spare" WTG positions to allow for installation and engineering flexibility.

Preliminary Screening and Rationale

BOEM sought NMFS's Greater Atlantic Regional Fisheries Office's (GARFO) input on determining which WTG positions should be removed to most effectively reduce impacts to complex benthic habitats in the Lease Area. GARFO provided four priority areas for potential avoidance (Figure K-1). In order of descending priority, GARFO identified Area 1 (8 WTG positions), Area 2 (38 WTG positions), Area 3a (6 WTG positions), and Area 3b (9 WTG positions). These priority areas were based on multibeam backscatter data and the presence of identified large boulders (i.e., > 0.5–1.0 meters in diameter) within the Lease Area; their proximity to Cox Ledge; and the importance of these habitats as EFH, particularly for Atlantic cod. Based on the COP and additional feedback from the applicant, BOEM continues to assume no change to the offshore substation locations due to feasibility constraints that would delay the Project to the extent that it would no longer meet the PPA obligations or BOEM's purpose and need as described in Chapter 1.2 of the EIS. The scientific rationale for the prioritization of the four priority areas is provided in the following paragraphs.

[3] In accordance with 30 CFR 585.634(C)(6), micrositing of WTG foundations may occur within a 500-foot (152-meter) radius around each proposed WTG location. The micrositing allowance for the Project is a diamond shaped area within the 500-foot (152-meter) radius circle surrounding foundation locations, ensuring 1.15-mile (1-nautical mile) spacing on the cardinal directions and no less than 0.7 mile (0.6 nautical mile) on the inter-cardinal directions.

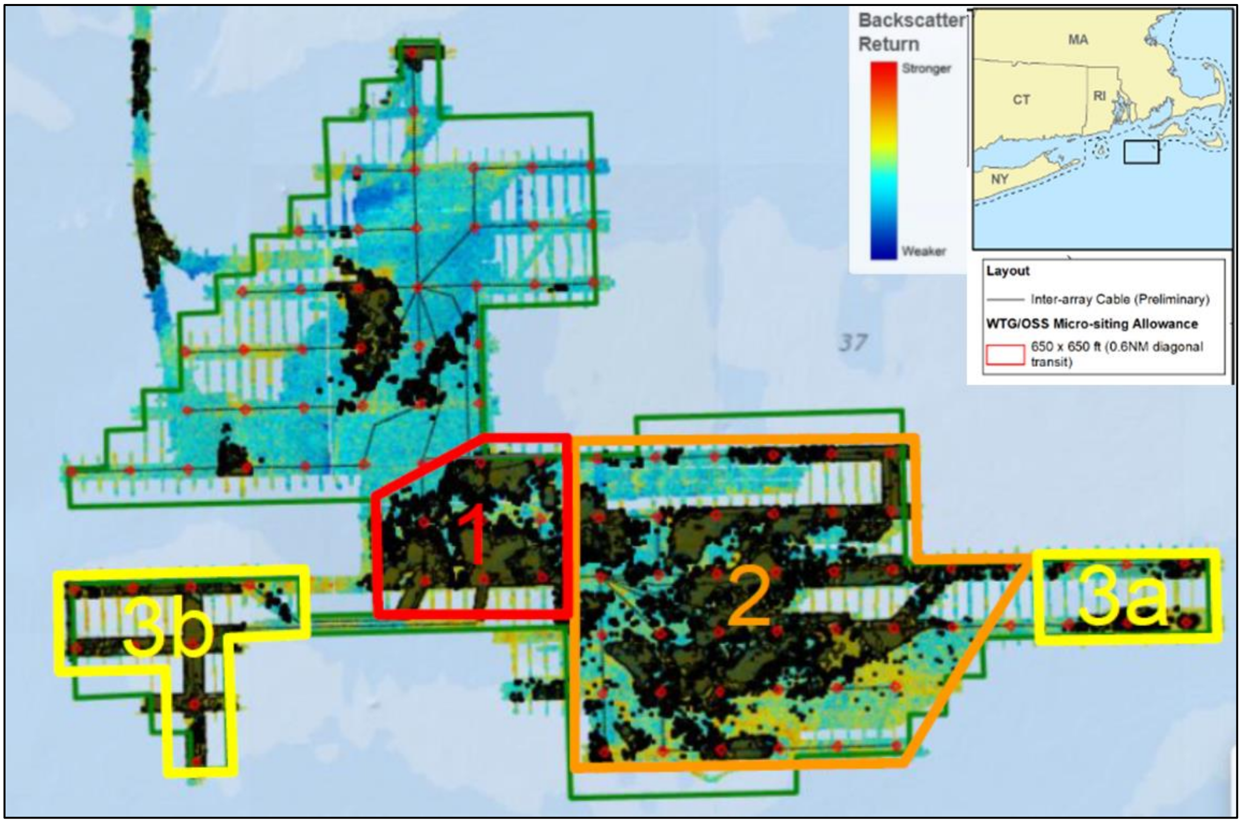

Figure K-1. Alternative C development. Revolution Wind Lease Area with multi-beam backscatter and boulder presence (dark green with black outlines; data from COP Appendix X2) shown in relation to the four priority areas identified for avoidance by GARFO on November 5, 2021.

Area 1 contains contiguous complex habitat illustrated by high multibeam backscatter return and a high density of large boulders (> 0.5–1.0 meters in diameter). This area overlaps with documented cod spawning activity based on recent acoustic, telemetry, and fisheries-dependent biological sample data (Van Hoeck et al. 2022; Van Parijs 2022). GARFO requested no modification in the shape of this area targeted for removal.

Area 2 contains large areas of contiguous complex habitat illustrated by high multibeam backscatter return and a high density of large boulders (> 0.5–1.0 meters in diameter). Acoustic and telemetry data for Atlantic cod in this area are extremely limited (Van Parijs 2022). Ongoing research and emerging data will assist in evaluating the importance of this area for cod spawning. GARFO requested that any modification of this area be limited to modifying the boundaries of the area rather than selection of particular turbine locations within the area and should prioritize maintaining the largest contiguous complex habitat area feasible.

Areas 3a and 3b are areas of complex habitat illustrated by high multibeam backscatter return and identified large boulders (> 0.5–1.0 meters in diameter) in which cod spawning has not been detected previously or is unknown. There is no available information or data to aid in evaluating the importance of these areas for cod spawning. GARFO requested that any development of these areas be considered only if it would allow for the protection and conservation of higher priority areas.

If BOEM omitted all the turbines within the identified priority areas (a total of 61 WTGs), from Alternative C, then Alternative C would not meet the purpose and need. A discussion of the further reduction of impacts to these habitats through the selection of Alternative C in conjunction with Alternative F is provided in EIS Section 3.13.2. BOEM developed the layouts for Alternative C based on the following criteria:

- GARFO's identified priority areas (Figure K-1)
- Maintaining continuity of complex habitat
- Boulder density (higher density areas were avoided over lower density areas)
- Multibeam backscatter data (high backscatter areas were avoided over lower backscatter areas) and,
- Engineering considerations such as maintaining linearity of inter-array cable layouts and maintaining offshore substation locations

BOEM identified two layouts for Alternative C that aim to address these criteria. Alternative C1 removes all WTG positions from Area 1 and 27 WTG positions from Area 2 leaving 65 WTG positions remaining (Figure K-2). Alternative C2 removes all WTG positions from Area 1 and 28 WTG positions from Area 2 leaving 64 WTG positions remaining (Figure K-3). Alternative C1 reduces development in areas of contiguous complex habitat slightly more than Alternative C2. Alternative C2 shifts exclusion of three WTG positions from the southeastern portion to areas further north to reduce development in or adjacent to known cod spawning areas, however, resulting in slightly less complex habitat avoided when compared to Alternative C1. See EIS Section 3.6.2.4 for more information on differences in impacts to complex habitats.

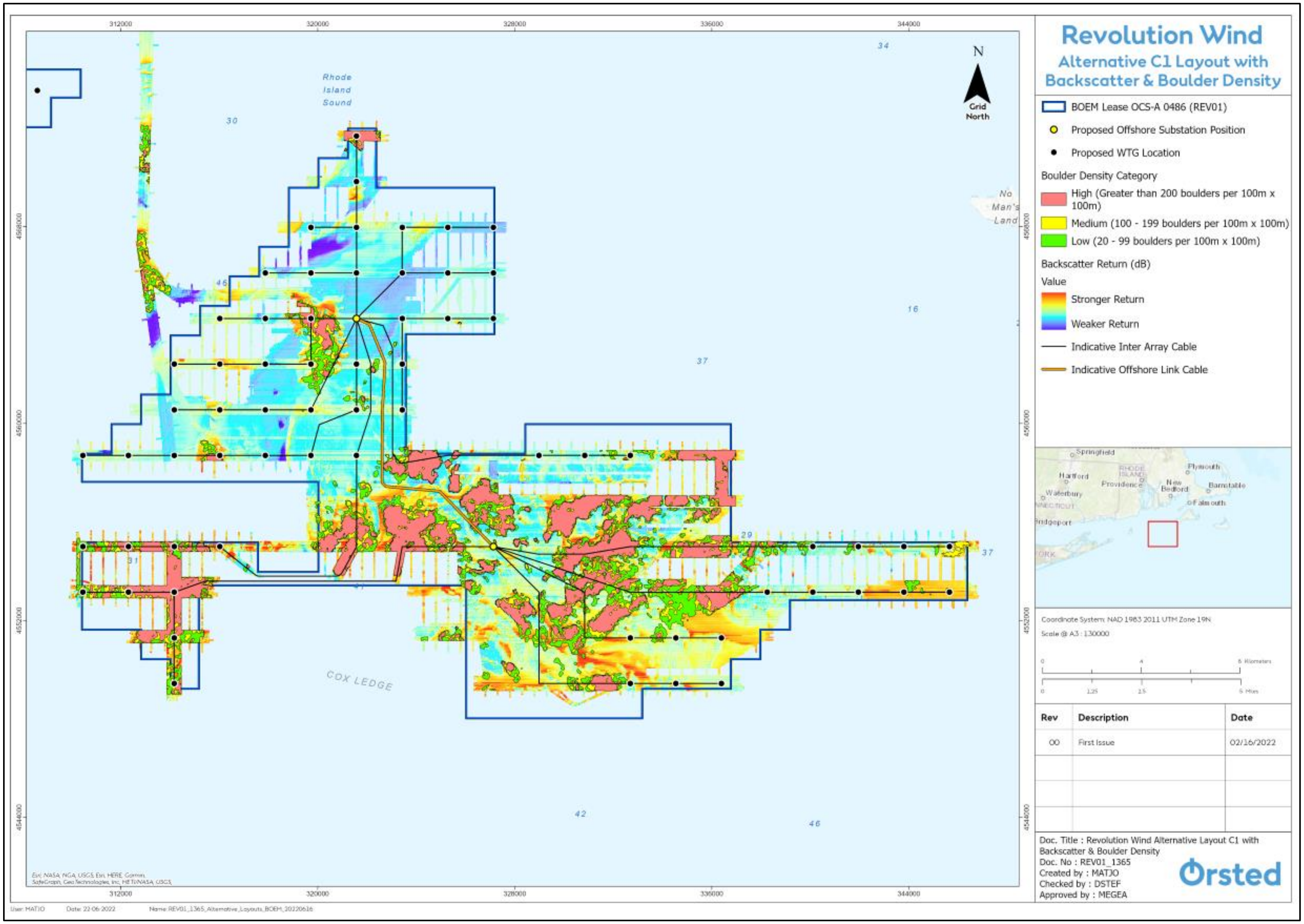

Figure K-2. Alternative C1 layout overlaid with backscatter and boulder density data. Image courtesy of Orsted.

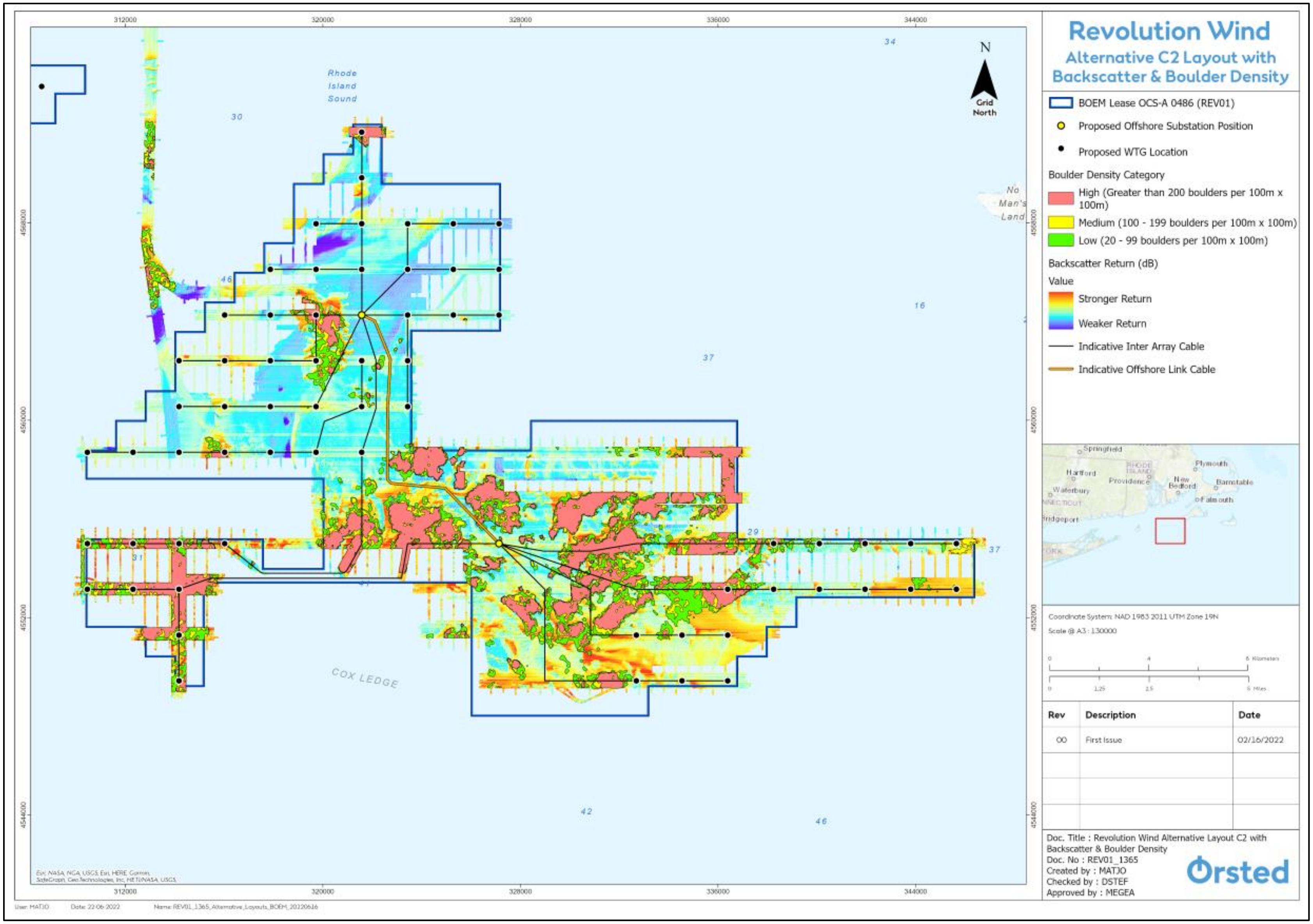

Figure K-3. Alternative C2 layout overlayed with backscatter and boulder density data. Image courtesy of Orsted.

Alternative E: Reduction of Surface Occupancy to Reduce Impacts to Culturally Significant Resources Alternative (Viewshed Alternative)

Background

The federally recognized Wampanoag Tribe of Gay Head (Aquinnah) have identified certain unencumbered views from the Gay Head Cliffs (i.e., Aquinnah Cliffs) on Martha's Vineyard as important to their oral history, traditions, cultural practices, and as a traditional cultural property (TCP) associated with the Wampanoag cultural hero Moshup. Through scoping and ongoing government-to-government consultation, the northernmost WTGs nearest to the Gay Head Cliffs were identified of the highest concern to the Wampanoag Tribe of Gay Head (Aquinnah), especially at sunset when these WTGs would be backlit and silhouetted. In a letter to BOEM on July 12, 2021, the tribe's historic preservation office noted the importance of the tribe's ancestral lands on the west side of Martha's Vineyard that include Gay Head Cliffs, designated as a national natural landmark by the National Park Service (Washington 2021). The letter also provided a map of the wind development area with an east to west line in which the Wampanoag Tribe of Gay Head (Aquinnah) opposes any development north thereof (Figure K-4). The tribe has expressed concerns that the introduction of offshore wind infrastructure will adversely affect the recently identified Vineyard Sound and Moshup's Bridge TCP and the Gay Head Cliffs National Natural Landmark (which is also part of the traditional cultural property). Factoring in the information and concerns of the Wampanoag Tribe of Gay Head (Aquinnah) and other stakeholders, along with balancing the purpose and need in EIS Section 1.2, BOEM considered a suite of options for removing WTG positions aimed at reducing impacts to viewsheds on and surrounding Martha's Vineyard.

Given the proximity of the Project to Martha's Vineyard, visibility of the offshore components cannot be completely eliminated under any action alternative or layout option, while maintaining the minimum positions needed to fulfill the PPA obligations (i.e. 704 MW). To determine which WTG positions could be removed to reduce visual impacts most effectively to these cultural resources, while still meeting the purpose and need, BOEM developed multiple layout options for Alternatives E1 and E2 and directed the Project applicant, Revolution Wind, to produce visual simulations of these layouts. BOEM shared these simulations with the Wampanoag Tribe of Gay Head (Aquinnah) and requested feedback on these potential layouts on September 10, 2021, and again on October 12, 2021, after an additional option was simulated.

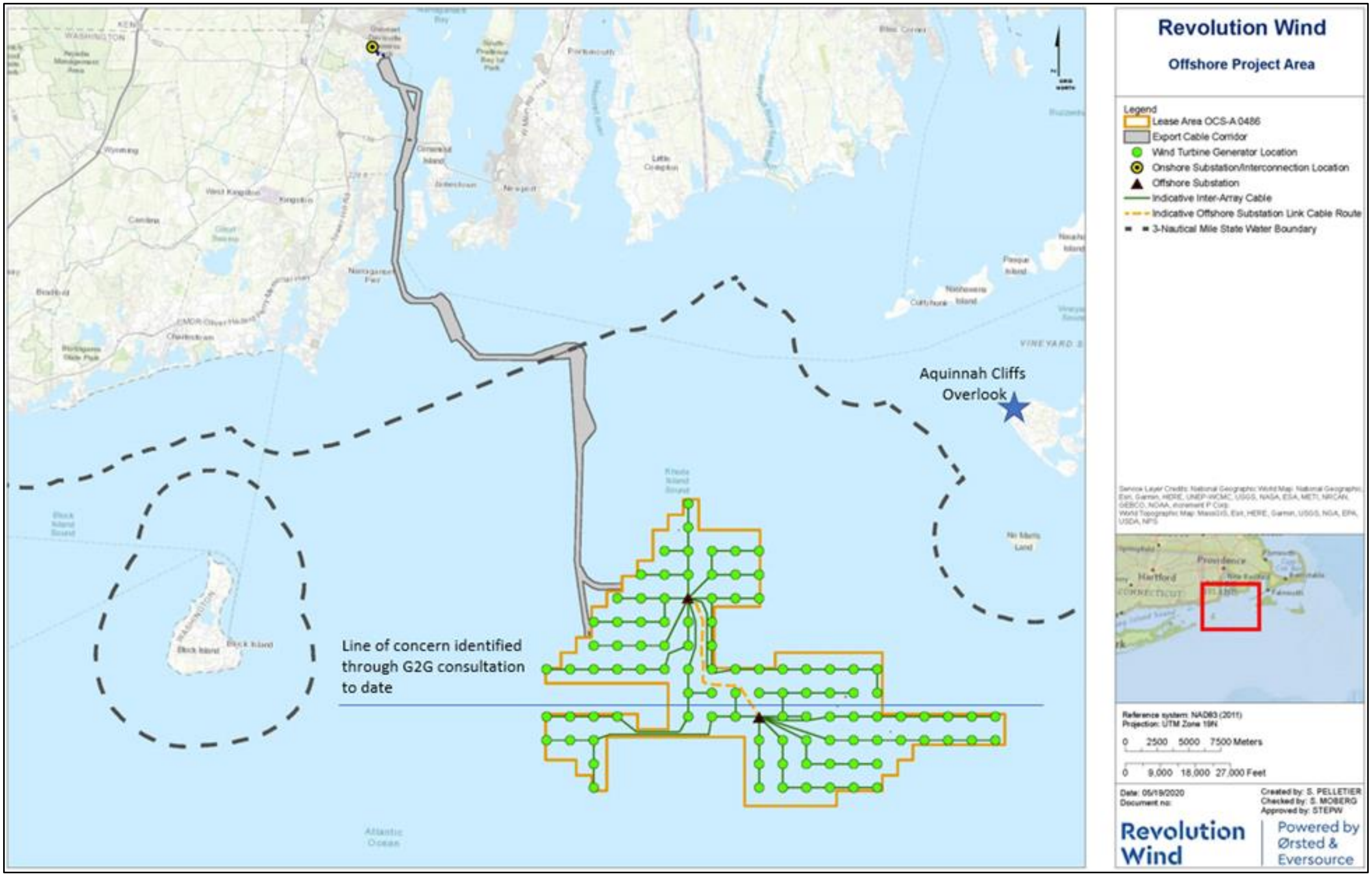

Figure K-4. The line of concern provided by the Wampanoag Tribe of Gay Head (Aquinnah) overlaid with the Lease Area as proposed in Revolution Wind's COP.

Preliminary Screening and Rationale

BOEM directed Revolution Wind to simulate eight potential WTG layouts for the Viewshed Alternative (four for E1 and four for E2). Figures K-5 through K-12 outline the layouts that were simulated and reviewed by BOEM's subject-matter experts and shared with the Wampanoag Tribe of Gay Head (Aquinnah) for input. No specific responses were received from the tribe; however, applying best professional judgement and input previously received by the tribe and other stakeholders, BOEM's subject-matter experts concluded that options E1-3 (Figure K-7) and E2-4 (Figure K-12) were most effective at reducing the visual impacts of concern at or near the Gay Head Cliffs, as well as other national historic landmarks and culturally important resources in Rhode Island and Massachusetts. Therefore, options E1-3 and E2-4 were carried forward for detailed analysis as Alternatives E1 and E2 in the EIS, acknowledging that neither alternative completely eliminates the visual impacts of concern for the reasons outlined above but offer a reasonable range of alternatives for consideration by stakeholders and the decisionmaker.

Layout option E1-3 (see Figure K-7) was carried forward because the WTGs on the northwest end appear further apart, reducing the visual clutter and "curtain effect" from the visual overlapping of WTG towers and blades. The horizontal field-of-view of the Project is also less in E1-3 than in all other layouts simulated except for E2-4, with enough positions remaining to fulfill the PPA agreements (i.e. 704 MW).

Layout option E2-4 (see Figure K-12) was carried forward because it reduces the number of WTGs that occupy the northwest end of the field-of-view within the sunset views from the Gay Head Cliffs overlook. Although this layout does not decrease visual prominence of WTGs further east in the Lease Area, it allows for a larger unobstructed sunset view within the northwestern portion of the Lease Area with enough positions remaining to fulfill the PPA agreements (i.e. 704 MW) up to the maximum potential output of the Project (880 MW). Figure K-13 provides a sunset simulation overlaid with the WTG positions that would be removed north-northwest of the northernmost offshore substation under layout option E2-4.

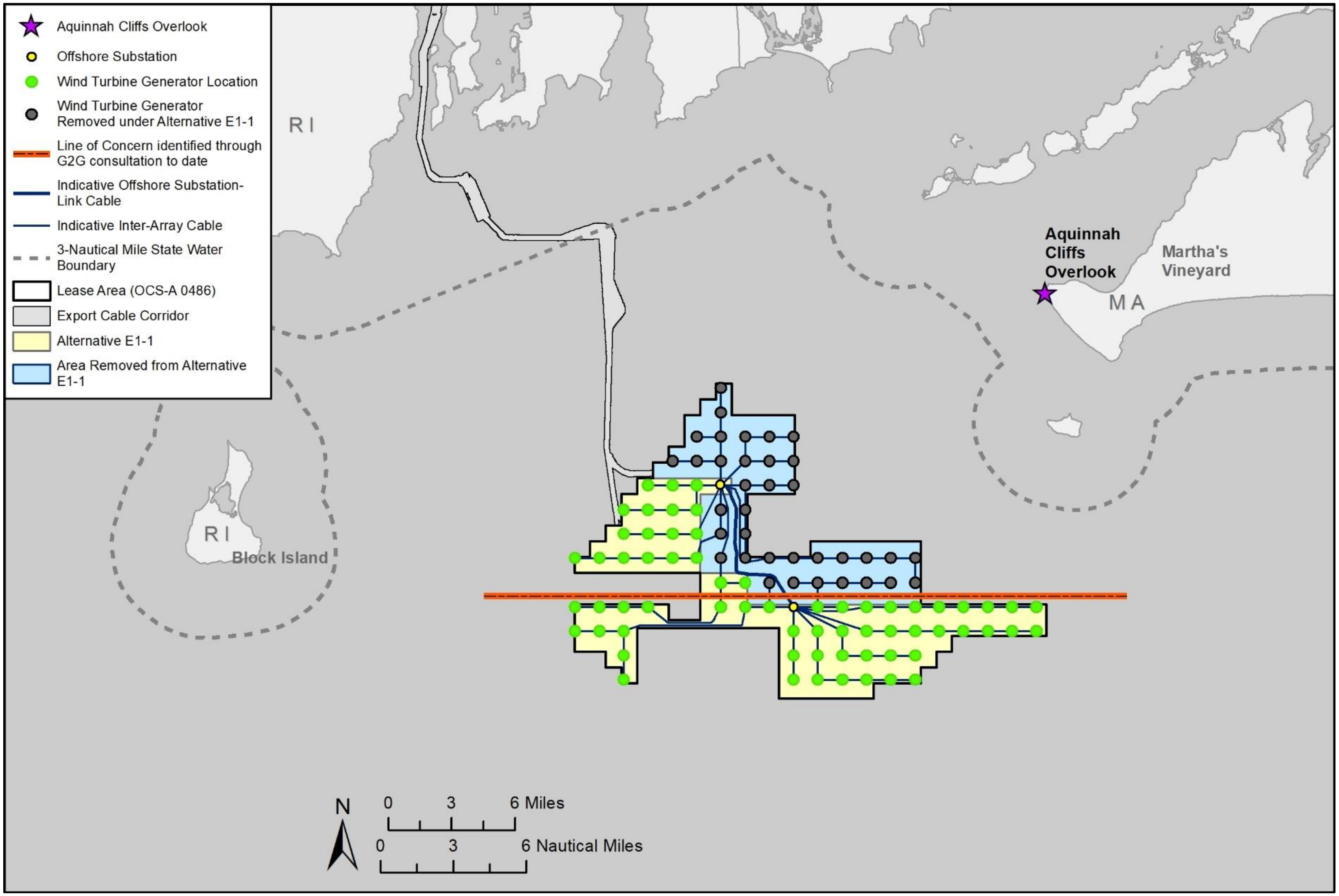

Figure K-5. Layout option 1 simulated for Alternative E1 (Alternative E1-1). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 704 MW maximum output; removal of 36 WTG positions (leaves 64 positions available).

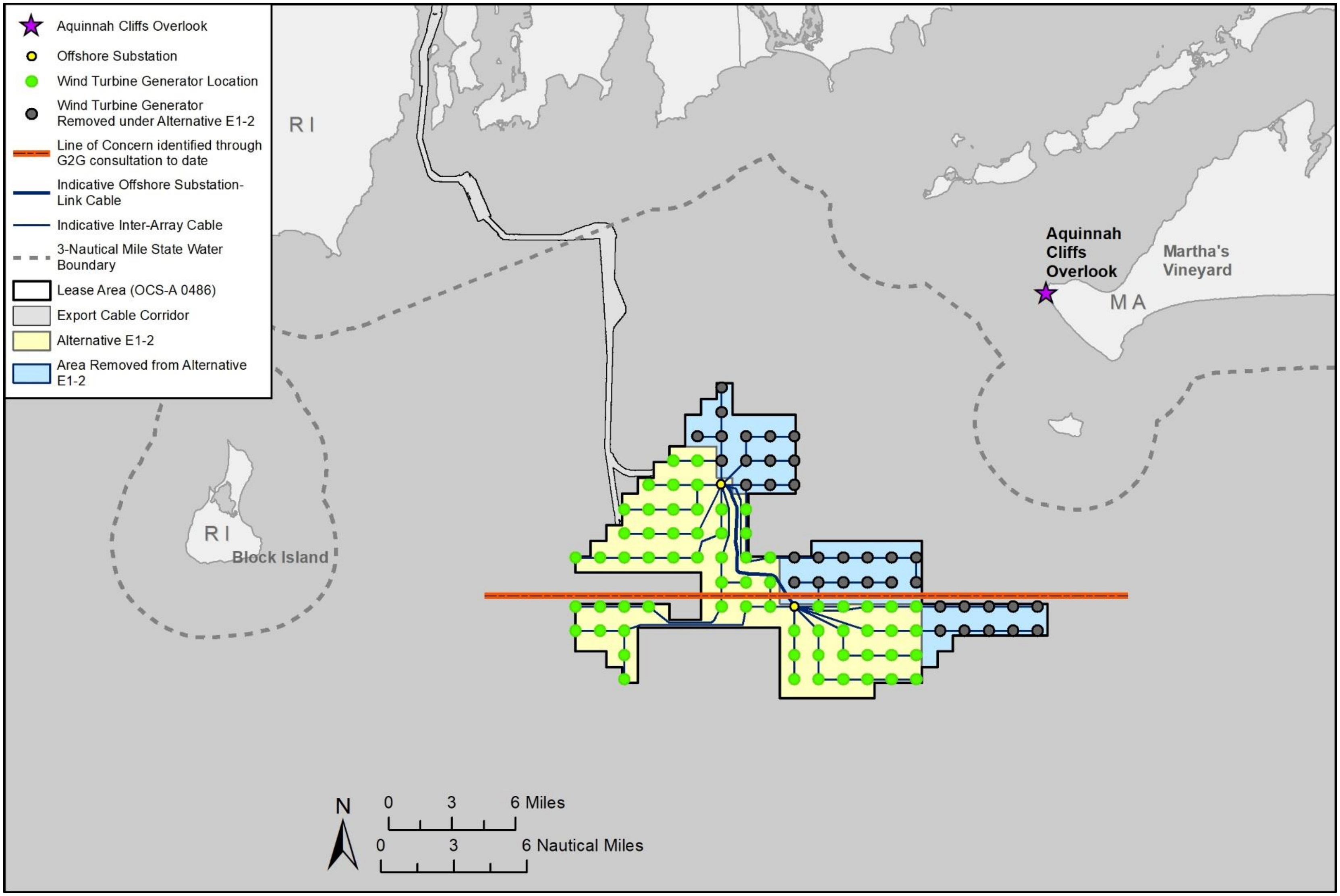

Figure K-6. Layout option 2 simulated for Alternative E1 (Alternative E1-2). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 704 MW maximum output; removal of 36 WTG positions (leaves 64 positions available).

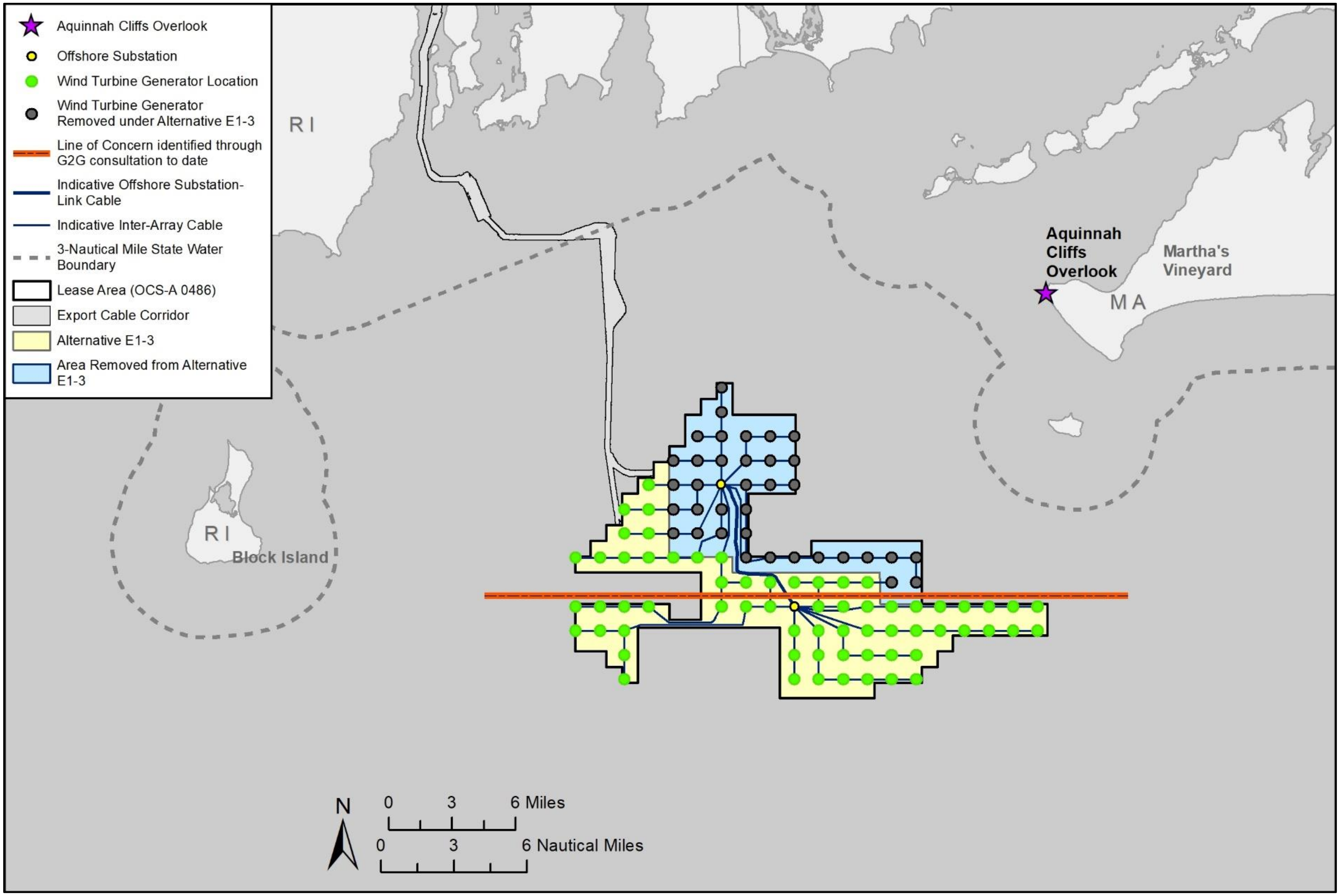

Figure K-7. Layout option 3 simulated for Alternative E1 (Alternative E1-3). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 704 MW maximum output; removal of 36 WTG positions (leaves 64 positions available).

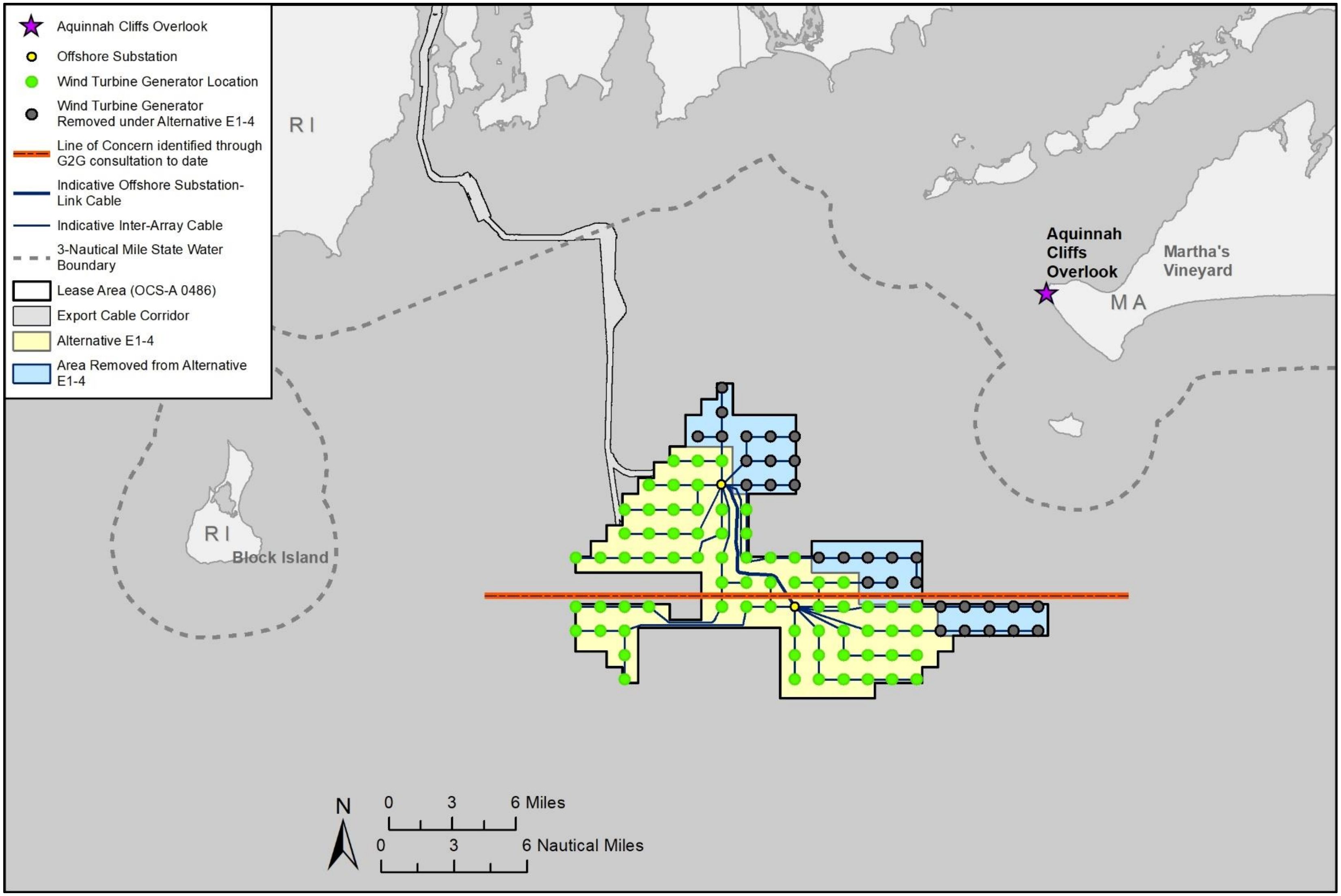

Figure K-8. Layout option 4 simulated for Alternative E1 (Alternative E1-4). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 828 MW maximum output; removal of 31 WTG positions (leaves 69 positions available).

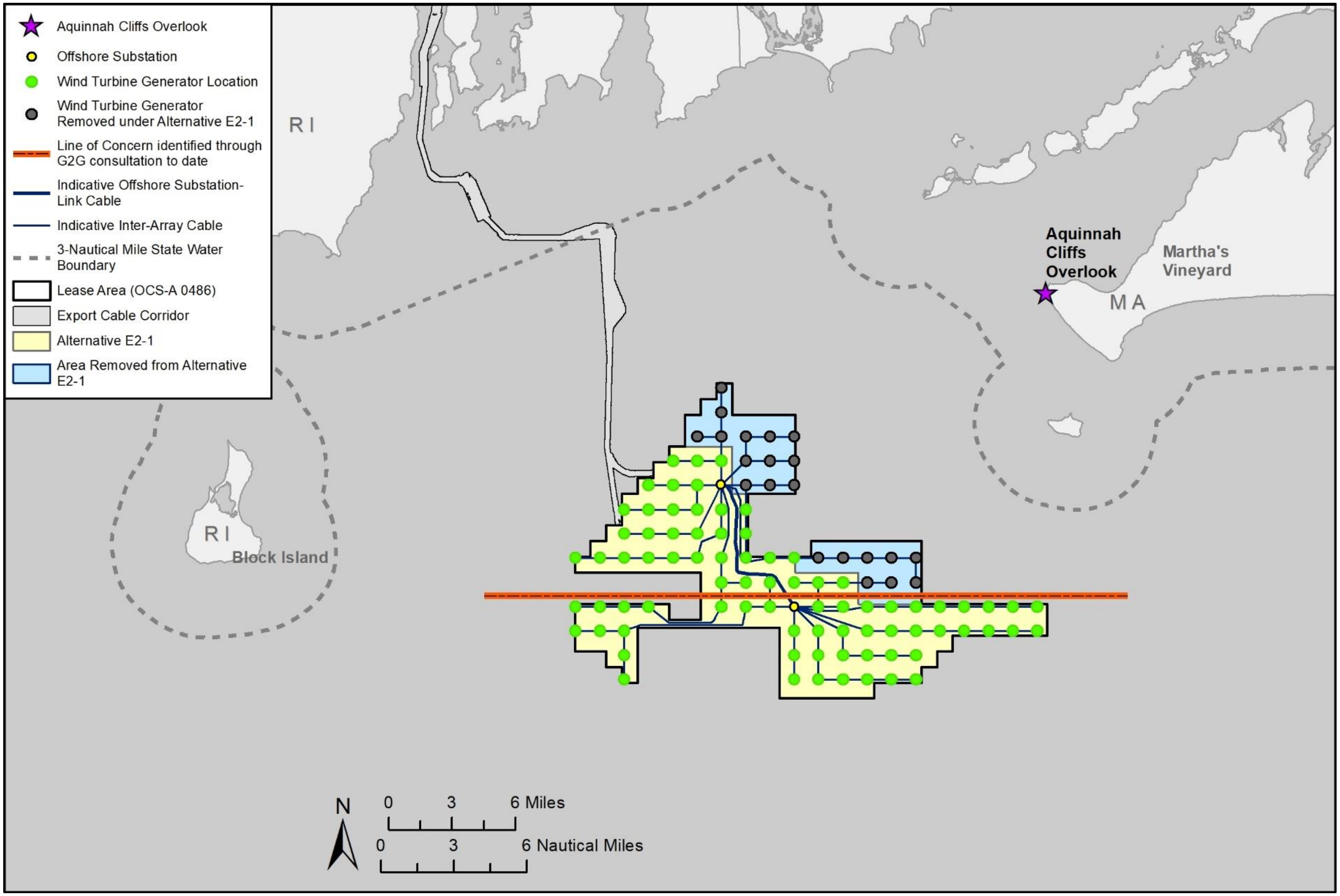

Figure K-9. Layout option 1 simulated for Alternative E2 (Alternative E2-1). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 880 MW maximum output; removal of 21 WTG positions (leaves 79 positions available).

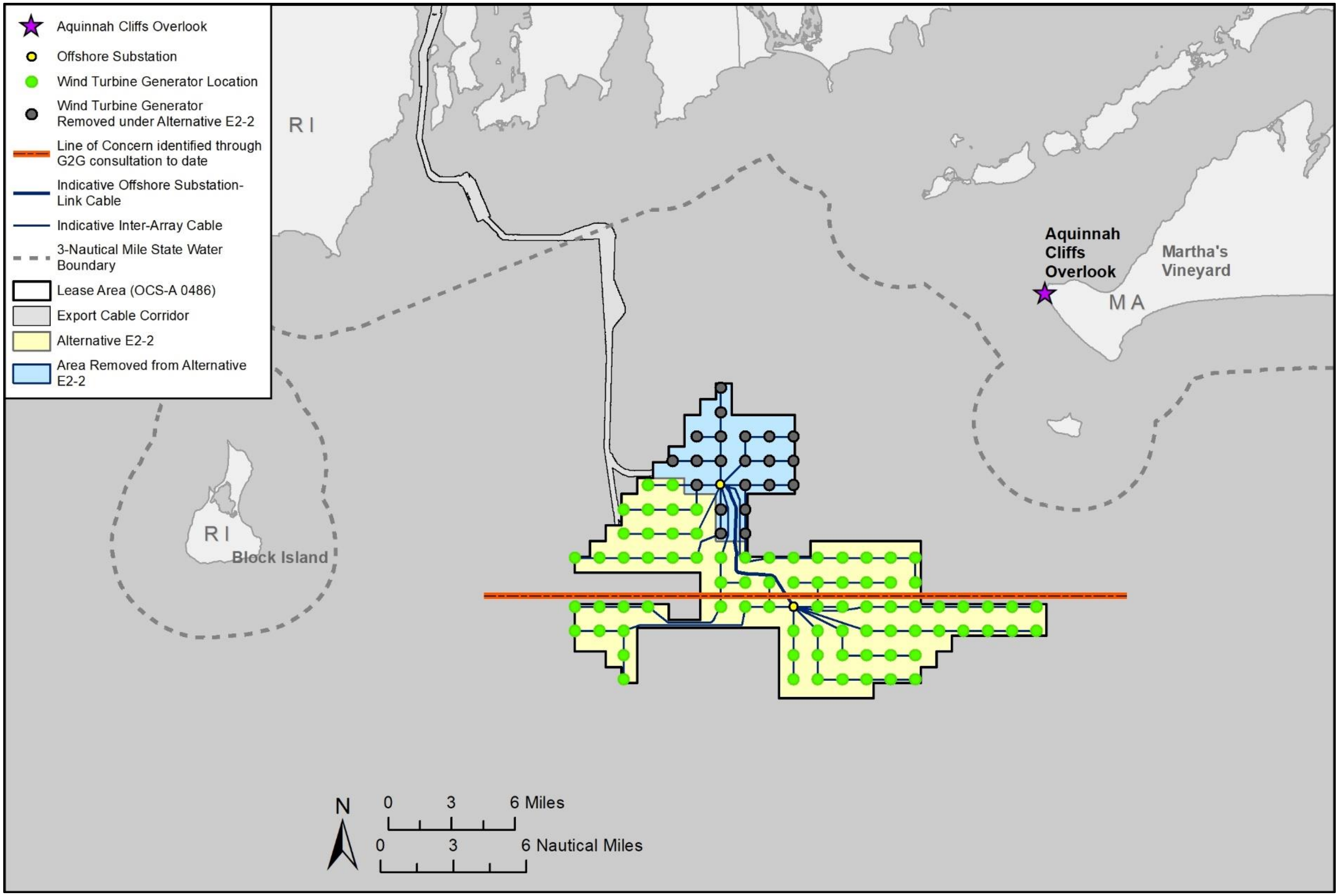

Figure K-10. Layout option 2 simulated for Alternative E2 (Alternative E2-2). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 880 MW maximum output; removal of 21 WTG positions (leaves 79 positions available).

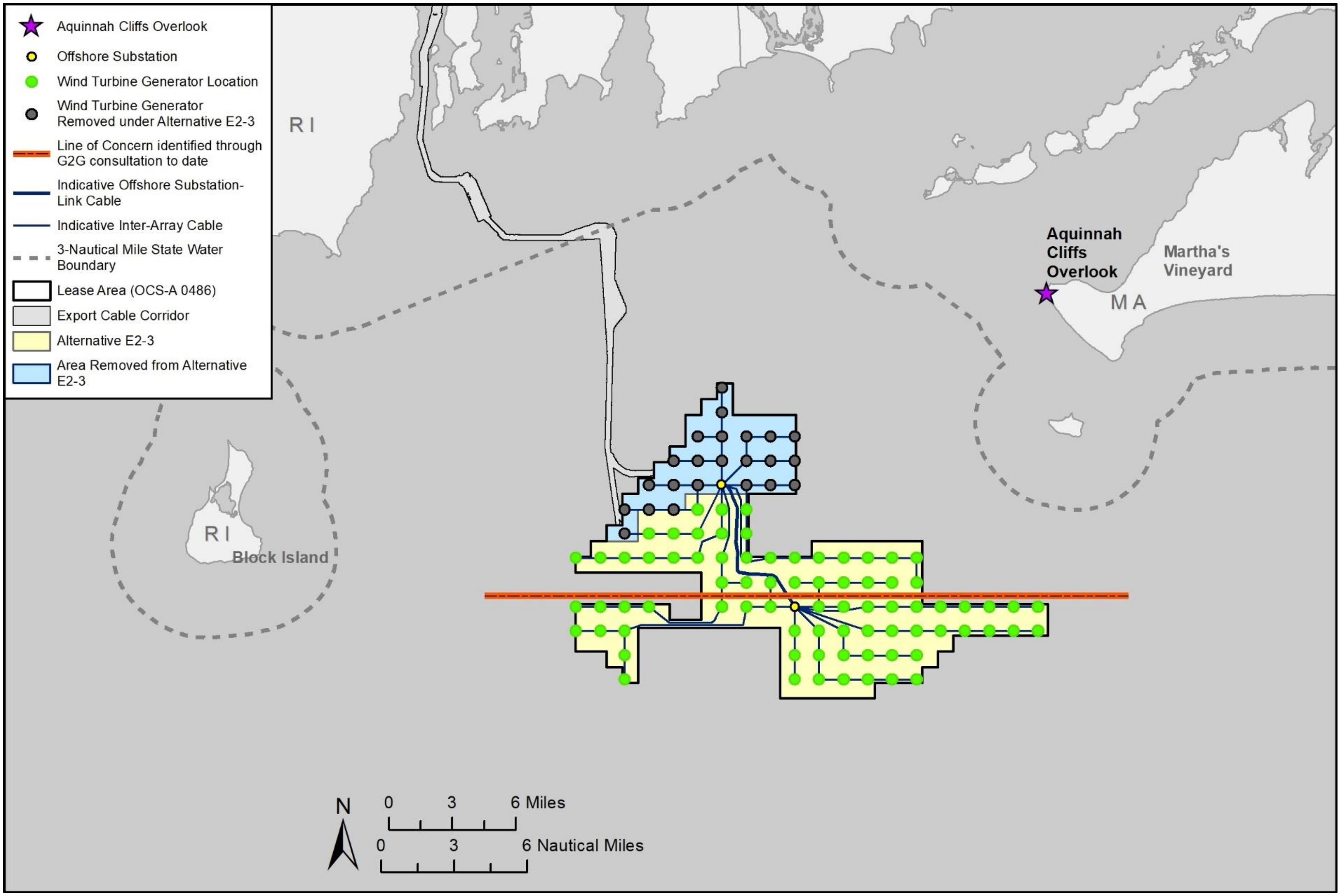

Figure K-11. Layout option 3 simulated for Alternative E2 (Alternative E2-3). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 880 MW maximum output; removal of 23 WTG positions (leaves 77 positions available).

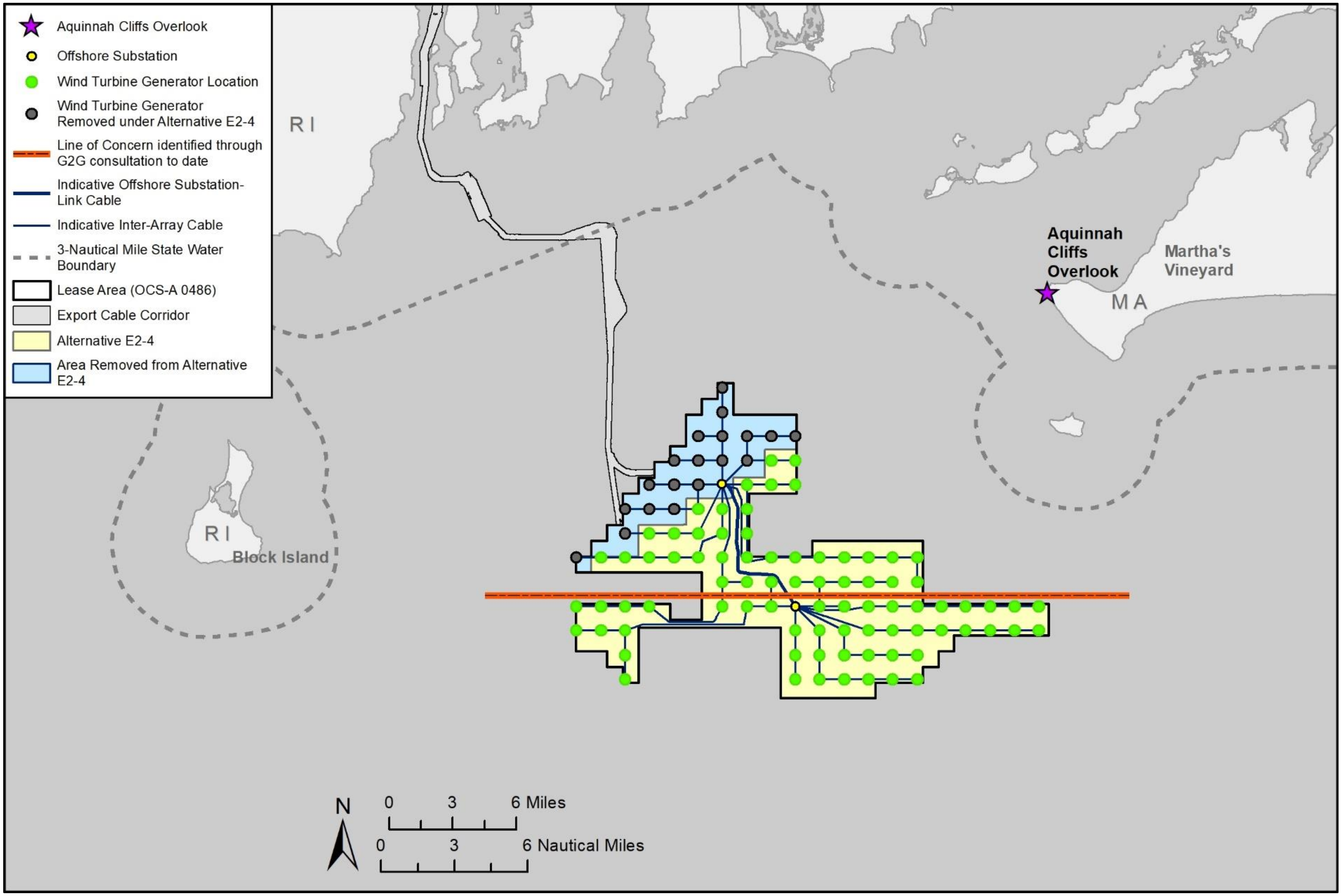

Figure K-12. Layout option 4 simulated for Alternative E2 (Alternative E2-4). Gray shaded WTG positions in the blue field are those that would be eliminated from consideration. 880 MW maximum output; removal of 23 WTG positions (leaves 77 positions available).

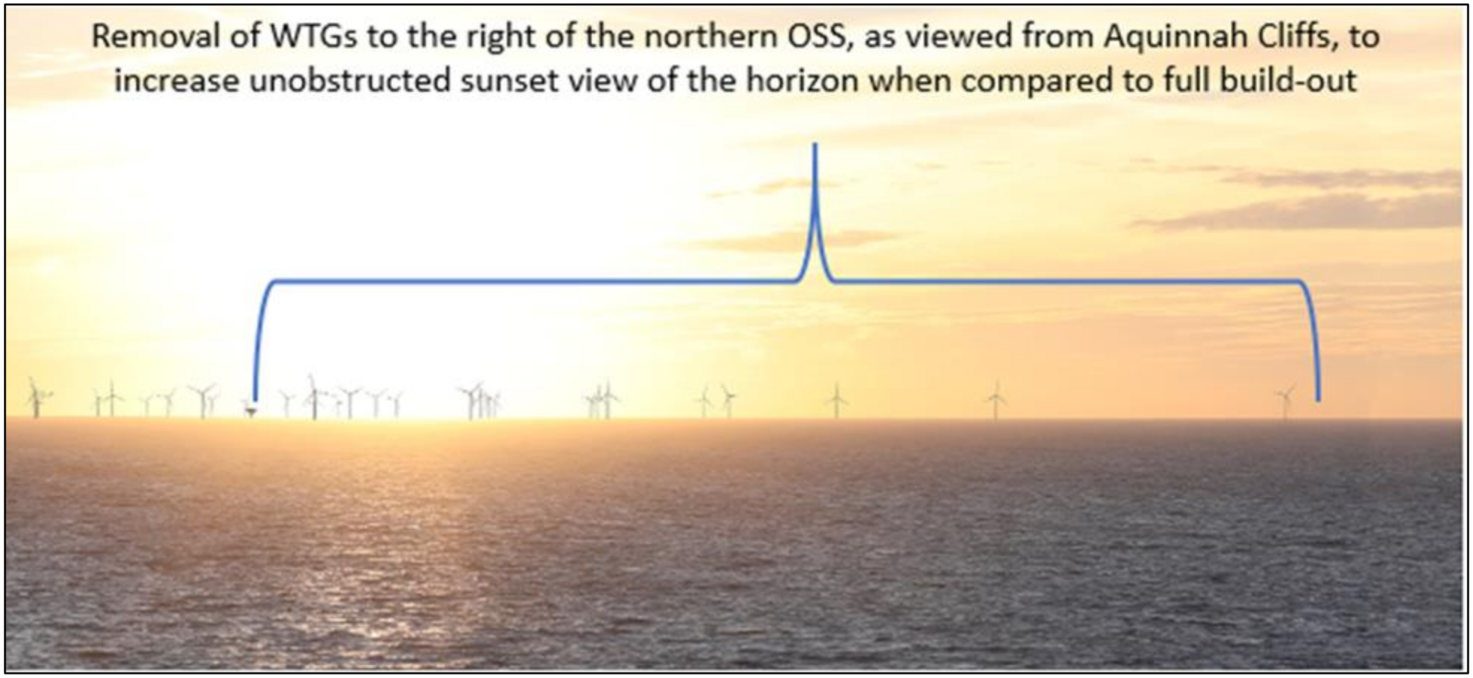

Figure K-13. Simulated sunset view facing the Project from Aquinnah Cliffs, indicating the WTG positions that would be removed under layout option E2-4.

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