VINEYARD OFFSHORE

SUBMISSION FOR PURCHASE OF OFFSHORE WIND RENEWABLE ENERGY CERTIFICATES

ORECRFP24-1

PUBLIC

SEPTEMBER 9, 2024

Confidentiality Statement

Certain information in this proposal is non-public, proprietary, commercial, and/or financial information ("Confidential Information"), which has been redacted from the version of this proposal marked "PUBLIC." Such Confidential Information has been redacted from this proposal and/or is clearly marked "CONFIDENTIAL" or "REDACTED". Vineyard Offshore intends for all such Confidential Information to remain confidential. Further, the version of this proposal marked "CONFIDENTIAL" should be treated as a non-public record that is exempt from disclosure under applicable laws and as set forth in the Request for Proposals ORECRFP24-1 Purchase of Offshore Wind Renewable Energy Certificates issued on July 17, 2024 and updated on August 13, 2024.

Section 8.2 Environmental Mitigation Plan

Response to New York State Energy Research and Development Authority Request for Proposals ORECRFP24-1

VINEYARD OFFSHORE

PUBLIC

Table of Contents

List of Attachments

Abbreviations

Abbreviation	Meaning
>	greater than
ADLS	aircraft detection lighting system
BACI	Before-After-Control-Impact [framework]
BAG	Before-After-Gradient [framework]
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
dB	decibel(s)
E-TWG	NYSERDA's Environmental Technical Working Group
EMF	electromagnetic field
ESA	Endangered Species Act
ESP	electrical service platform
G&G	geophysical and geotechnical
HDD	horizontal directional drilling
HMS	highly migratory species
HRG	high-resolution geophysical
IHA	Incidental Harassment Authorization
the "Lease Area"	Lease Area OCS-A 0544
"metocean"	meteorological towers and meteorological and oceanographic
MW	megawatt(s)
NARW	North Atlantic right whale
NAS	noise attenuation system
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYSDPS	New York State Department of Public Service
NYSERDA	New York State Energy Research and Development Authority
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
OCS	Outer Continental Shelf
OECC	offshore export cable corridor
OWF	Offshore Wind Generation Facility
PAM	passive acoustic monitoring
PEIS	Programmatic Environmental Impact Statement
the "Project"	Excelsior Wind
PSO	Protected Species Observer
QA	quality assurance

Abbreviation	Meaning
QC	quality control
RI/MA WEA	Rhode Island/Massachusetts Wind Energy Area
RODEO II	Realtime Opportunity for Development Environmental Observations II
ROSA	Responsible Offshore Science Alliance
RWSC	Regional Wildlife Science Collaborate for Offshore Wind
SFV	sound field verification
USFWS	United States Fish and Wildlife Service
WFIP3	3rd Wind Forecast Improvement Project
WHOI	Woods Hole Oceanographic Institution
WOW	Wildlife and Offshore Wind
WTG	wind turbine generator
WTRIM	Wind Turbine Radar Interference Mitigation

8.2 ENVIRONMENTAL MITIGATION PLAN

8.2.1 Environmental Mitigation Plan Summary

The Environmental Mitigation Plan presented herein applies to Excelsior Wind (the "Project"), which includes a 1,350 megawatt (MW) Offshore Wind Generation Facility (OWF) that will be installed in Lease Area OCS-A 0544 (the "Lease Area") on the Outer Continental Shelf (OCS).

[redacted]

Vineyard Offshore is committed to developing, constructing, operating, and decommissioning well-sited offshore wind projects with minimal environmental impact. For Vineyard Wind 1, the nation's first commercial-scale offshore wind project, we pioneered a successful approach that prioritized avoiding, minimizing, or mitigating potential impacts whenever possible. We will continue our industry-leading efforts for the Project to proactively conserve and protect threatened and endangered species while considering changing technologies, best available data, and lessons learned from other offshore wind projects.

Offshore wind is a critical climate change mitigation solution. The rapid deployment of offshore wind by a company that understands the process, that has fostered relationships with stakeholders, and that has a proven track record of responsible development—like Vineyard Offshore—is essential to meet New York State's emission reduction goals. Vineyard Offshore is committed to ensuring that we employ measures that afford the highest levels of environmental protection while maintaining Project viability. Throughout the Project's multi-year permitting process, we will continue to assess potential risks to species and identify measures to avoid, minimize, or mitigate potential impacts to wildlife in line with applicable federal and state permitting requirements as well as regional monitoring efforts. Stakeholder input, as well as lessons learned from Vineyard Wind 1 and other offshore wind projects, will inform this effort.

We have thoroughly reviewed existing literature and site-specific data to characterize the species and habitats within the areas potentially impacted by the Project. Our assessment draws upon a considerable body of existing data for the New York Bight region (see the references list provided in Attachment 8.2-1). We have already completed our benthic habitat survey and have coordinated with the Wildlife Conservation Society to site a passive acoustic monitoring (PAM) recorder in the Lease Area as part of a New York State Energy Research and Development Authority (NYSERDA)-funded PAM project. For the Lease Area, we are fully engaged in the Programmatic Environmental Impact Statement (PEIS) process, led by the Bureau of Ocean Energy Management (BOEM), to analyze potential impacts from wind energy development activities in the New York Bight region.

As the Project moves forward, we will continue to invest considerable time and resources to identify and employ practicable and appropriate measures that afford the highest levels of environmental protection while maintaining Project viability. This data-driven process will incorporate the experience gained from Vineyard Wind 1 as well as other offshore wind projects. We will also continue working closely with agencies and stakeholders to understand their concerns regarding the potential environmental impacts of offshore wind projects; incorporate their feedback into Project design and siting measures; and develop, trial, and implement innovative environmental protection measures.

8.2.2 Communications and Collaboration

8.2.2.1 Stakeholder Identification

The Vineyard Offshore team has spent much of the past decade working with a range of stakeholder groups to develop and permit commercial-scale offshore wind projects. Along the way, we have formed productive working relationships with many stakeholders interested in environmental issues, including those in New York. As further described in Section 8.3, we identify stakeholders relevant to both onshore and offshore environmental issues by (1) participating in federal, state, and regional environmental and fisheries technical working groups, advisory boards, councils, and commissions; (2) engaging early and often with federal, state, and local community stakeholders; (3) hosting and attending open houses, community events, and conferences; (4) conducting site visits; and (5) hiring subject matter experts and local teams, among many other strategies.

Members of our team have been actively engaged in the NYSERDA Environmental Technical Working Group (the E-TWG) since its formation. We are also a member of and/or actively participate in a number of other technical working groups, advisory boards, councils, and commissions that focus on environmental issues and offshore wind. For example, our Chief Development Officer is on the Responsible Offshore Science Alliance (ROSA) Board of Directors, and our Senior Manager, Fisheries, is a member of the ROSA Advisory Council. We are also an active member of the Regional Wildlife Science Collaborative for Offshore Wind (RWSC) with representatives serving on the RWSC Industry Caucus and Steering Committee. We are also a member of the New York Offshore Wind Alliance, are on the Waterfront Alliance Corporate Council, and consult with local groups, including Wind Works Long Island, a coalition made up of environmental organizations like Citizens Campaign for the Environment, New York League of Conservation Voters, Renewable Long Island, Students For Climate Action, and more. These groups allow us to keep stakeholders apprised of our Project development efforts, better understand concerns, build relationships, and collaborate on research, education, and work opportunities.

As discussed in Section 6.2, we have had numerous consultations with federal, state, and local agencies. We are in regular contact with relevant federal agencies (e.g., BOEM and National Marine Fisheries Service [NMFS]) on environmental matters. We will also continue engaging with New York State agencies, including meeting with Consulting State Agencies. [redacted]

[redacted] We are continuing to employ this proactive approach as we further develop the Vineyard Mid-Atlantic Construction and Operations Plan (COP) and prepare New York State permit applications.

Finally, we have partnered on research and innovation initiatives with multiple organizations and institutions across our project portfolio. [redacted] We have also coordinated with the Wildlife Conservation Society to place a PAM detector in the Lease Area. We will maintain these relationships and develop new partnerships in New York for the Project with an expected focus on supporting independent research and regional studies.

8.2.2.2 Communication

Our engagement with stakeholders interested in environmental issues prioritizes information sharing, soliciting feedback on the design and execution of the Project, and supporting an efficient and timely permitting process. Throughout every phase of the Project, we will continue to actively engage and communicate with stakeholders; foster, build, and maintain trusted relationships; work to better understand and address concerns; and clearly communicate the reasons behind the decisions we make. We will accomplish this through our involvement in the groups described in Section 8.2.2.1, our website and social media platforms, and attending and sponsoring conferences and events, among several other methods. Our communication methods and tools are further detailed in Section 8.3.

8.2.3 Environmental Monitoring and Research Pre-, During-, and Post-construction

8.2.3.1 Baseline Data and Pre-construction Monitoring

Since acquiring the Lease Area in 2022, we have completed a robust series of benthic surveys of the Lease Area and OECC. In May 2024, we deployed a meteorological buoy in the Lease Area to collect wave, wind, and current data. The buoy includes a Motus Wildlife Tracking System to collect data to help address information gaps on offshore movements of birds and bats, including Endangered Species Act (ESA)-listed species. These activities supplement the considerable body of existing literature and survey data for the New York Bight area. As such, the ecological baseline for the Lease Area and surrounding waters is well understood and is described in the Vineyard Mid-Atlantic COP. Existing data sources and our completed survey efforts are further described in Sections 8.2.5 through 8.2.7 and Attachment 8.2-2, which contains excerpts from the initial filing of the Vineyard Mid-Atlantic COP.

Furthermore, BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight (see Section 6.2). As part of the PEIS process, BOEM is drawing on the wealth of existing literature and survey data to characterize the distribution, abundance, and composition of wildlife potentially affected by offshore

development activities in the New York Bight region. Vineyard Offshore is fully engaged in this process, and we have built upon the PEIS's assessment of biological resources in the Vineyard Mid-Atlantic COP. In doing so, we have leveraged our extensive experience preparing site assessments for three other COPs (Vineyard Wind 1, New England Wind,[1] and Vineyard Northeast [Lease Area OCS-A 0522]). Key data sources that we have used to characterize wildlife potentially affected by the Project are discussed in Attachment 8.2-2.

Although existing data are sufficient to establish an environmental baseline for the purposes of a COP, we expect to perform additional pre-construction surveys in our Lease Area. In alignment with NMFS's comments on the PEIS, we would work with regional experts to develop robust pre-construction surveys with adequate sample sizes, appropriate spatial and temporal coverage, and proper design. We would also continue to design our surveys to be compatible with established survey methods, whenever practicable, so that data generated can be compared with existing data and ongoing regional studies. For example, our fisheries surveys in Lease Area OCS-A 0522 followed the same protocols used for Vineyard Wind 1 and are aligned with ongoing regional surveys (see Section 8.1.3). Going forward, we will seek to align our survey approaches with the outcomes of ongoing efforts by ROSA, RWSC, and agencies to standardize scientific methods, surveys, and monitoring plans.

8.2.3.2 During- and Post-construction Monitoring

Vineyard Offshore will conduct appropriate monitoring during construction and post-construction to assess potential changes to the ecological baseline established for the Project (see Sections 8.2.5 through 8.2.7). The monitoring measures will be determined in consultation with agencies and stakeholders through the Project's permitting processes and informed by those put in place for other offshore wind projects as well as by NYSERDA's Mitigation and Monitoring Practices Tool.[2] As with pre-construction surveys, during- and post-construction surveys will be thoughtfully designed to align with established methods to enhance data compatibility and utility, wherever practicable.

Vineyard Offshore will continue to gain valuable experience assessing changes attributable to Project activities through the monitoring plans being implemented for Vineyard Wind 1. For example, scientifically sound, statistically rigorous methods employed for Vineyard Wind 1 include a beyond Before-After-Control-Impact (BACI) framework to assess potential impacts to fish and a combination BACI-Before-After-Gradient (BAG) sampling design to assess potential impacts to benthic resources. In collaboration with federal and state agencies, leading ornithologists, and environmental non-government organizations, we developed a pre- and post-construction bird and bat monitoring program framework for Vineyard Wind 1 that could be applied to the Project. [redacted]

[1] The initial COP for New England Wind, an offshore wind energy development in Lease Area OCS-A 0534, was submitted in July 2020 by Vineyard Wind as a joint venture of Copenhagen Infrastructure Partners P/S and Avangrid Renewables. New England Wind is now being solely developed by Avangrid Renewables.

[2] See: NYSDEC Mitigation and Monitoring Practices Tool (MPD Tool).

[redacted]

8.2.4 Supporting Other Environmental Research

8.2.4.1 Environmental Data Transparency

The survey and monitoring work that we have conducted or plan to conduct (see Sections 8.2.5 through 8.2.7) will continue to generate a substantial body of environmental, fisheries, and other data. Much of that data are currently or will be publicly available through the federal and state permitting processes, as well as reports or academic publications that result from survey or monitoring work, and will be readily accessible to stakeholders.

We will continue working with agencies, stakeholders, and other offshore wind developers to find cost-effective and user-friendly ways to streamline and standardize available data across lease areas, particularly where there are gaps in extant databases. Where practicable, we will disseminate raw environmental data to the most appropriate database(s), such as those recommended in the *Wildlife Data Standardization and Sharing: Environmental Data Transparency for New York State Offshore Wind Energy* (NYSERDA 2021a), as soon as feasible following internal quality assurance and quality control (QA/QC), to maximize the data's exposure and utility. However, as noted in the study, "benthos, zooplankton and fish data, Protected Species Observer (PSO) data, and some other data types are poorly served by extant databases" and should be housed and made available by the data originator until appropriate databases exist. In accordance with Section 2.2.8 of ORECRFP24-1, Vineyard Offshore will provide a Data Management and Availability Plan to NYSERDA detailing how site and environmental data will be made available for use by third parties on an ongoing basis as soon as practicable after collection and QA/QC.

8.2.4.2 Data Sharing and Site Access

As described in Section 8.2.4.1, we have made or intend to make much of our environmental and fisheries data public. Our previous and ongoing efforts to share environmental and fisheries data include the following:

- We proactively publish our fisheries research on our website. Several years of fisheries data collected in Lease Area OCS-A 0522 are already available on Vineyard Offshore's website.[3] We are also responsive to data requests from agencies and other entities for data that are not included in these reports.

- We deployed a meteorological and oceanographic buoy in Lease Area OCS-A 0522. The buoy is collecting weather data, including wave height and direction, surface current, and air temperature, and is equipped with an acoustic receiver to track highly migratory species (HMS). A portion of the data collected by the buoy is transmitted to a public website.

[3] See: Offshore Wind Mariner Updates webpage.

- We (along with other developers) have entered into a data sharing agreement with the New England Aquarium that permits them to "freely disseminate" the data gathered by the HMS acoustic transmitters deployed in Lease Areas OCS-A 0522 and Lease Area OCS-A 0501, as well as any research results.

[redacted]

We will continue to coordinate with third-party scientists regarding the provision of data and site access, and we will review any requests on a case-by-case basis. We note that, except for temporary safety buffer zones established around work areas, third-party research vessels will be permitted to transit through and within the Lease Area. In certain instances, Vineyard Offshore may impose restrictions on data provision or the deployment of research equipment (e.g., buoys, environmental sensors, telemetry receivers, cameras) within our Lease Area, OECC, and on our facilities to protect proprietary and/or competitively sensitive information, maintain site security, ensure safety, among other benefits. All requests will be considered and discussed with the requestor and will not be unreasonably denied.

8.2.4.3 Supporting Regional Studies and Funding Independent Research

Vineyard Offshore is firmly committed to supporting regional studies, regional science organizations, and other independent environmental research. For example, we are an advisor on regional science projects, including Project WOW and the WHOI Wind Turbine Radar Interference Mitigation (WTRIM) project and 3rd Wind Forecast Improvement Project (WFIP3). Our Senior Manager, Environmental Affairs sits on the WFIP3 and WTRIM advisory boards and serves as an industry advisor on Project WOW's External Advisory Board. [redacted]

[redacted]

We are also providing funding for HMS research by the New England Aquarium and INSPIRE Environmental.

[redacted]

8.2.5 Marine Mammals and Sea Turtles

8.2.5.1 Presence of Marine Mammals and Sea Turtles

Numerous data sources characterize the distribution and abundance of marine mammals and sea turtles potentially affected by the Project. [redacted]

These studies, reports, sightings data, and surveys, which employ a variety of methodologies, provide comprehensive datasets that define marine mammal and sea turtle spatial and temporal distribution.

Based on these sources, a summary of marine mammal and sea turtle species potentially affected by the Project is provided in the following subsections. Attachment 8.2-2 provides a more detailed description of marine mammal and sea turtle presence in the Lease Area and surrounding waters.

8.2.5.1.1 Marine Mammals

Thirty-nine marine mammal species (whales, dolphins, porpoises, and seals) have been documented as present in the Western North Atlantic OCS region, which encompasses the Lease Area and OECC (BOEM 2013, 2014). All 39 marine mammal species are protected by the Marine Mammal Protection Act and some are also listed under the ESA. The five ESA-listed

marine mammal species that could occur in the Lease Area and OECC are the NARW, sperm whale (*Physeter macrocephalus*), fin whale (*Balaenoptera physalus*), blue whale (*Balaenoptera musculus*), and sei whale (*Balaenoptera borealis*). These species are listed as endangered at the federal and New York State level. The distinct population segment of humpback whale (*Megaptera novaeangliae*) that occurs in the vicinity of the Project has been delisted as an endangered species federally and has been proposed for removal from the state's list of threatened or endangered species (NYSDEC 2019).

The five federally listed species are the species of greatest concern given their biology, habitat use, low abundance, ESA status, existing threats, and potential to occur at least seasonally in and around the Lease Area and OECC. The presence of NARW is well-studied and continuously monitored (see Sections 8.2.5.2 and 8.2.5.3). NARWs are expected to migrate through New York Bight waters primarily during spring and fall, while traveling between feeding and breeding or calving regions (Hayes et al. 2022, 2023). However, the extended presence of NARWs observed in the New York Bight outside of the migratory period suggests NARWs may not exclusively be migrating through this region (Estabrook et al. 2021). In the New York Bight region, fin whales primarily occur in the summer, sei whales in the spring and summer, and sperm whales during all seasons. Blue whales are considered rare in the New York Bight and are thought to mainly occur in the New York Bight region in the winter and fall.

8.2.5.1.2 Sea Turtles

Four species of sea turtles are likely to occur in the Western North Atlantic OCS region, which encompasses the Lease Area and OECC: loggerhead sea turtles (*Caretta caretta*), Kemp's ridley sea turtles (*Lepidochelys kempii*), leatherback sea turtles (*Dermochelys coriacea*), and green sea turtles (*Chelonia mydas*). Under both federal and New York State law, Kemp's ridley and leatherback sea turtles are endangered, and the loggerhead and green sea turtle populations that occur in the vicinity of the Project are threatened (NYSDEC 2015). Sea turtle presence in the Lease Area and OECC is primarily limited to the summer and fall because sea turtles use warmer water habitats in the winter and spring. In addition, no nesting sites are expected near the Project's landfall site. Nevertheless, in light of sea turtles' status under the ESA and their occurrence in and around the Lease Area and OECC, all four species of sea turtles are considered species of greatest concern.

8.2.5.2 Surveys to Establish an Ecological Baseline and Assess Impacts

Using marine mammal and sea turtle density estimates generated from existing data sources, underwater acoustic and animal exposure modeling was conducted as part of the Vineyard Mid-Atlantic COP to assess the potential effects of pile driving noise. First, acoustic modeling of impact pile driving was completed to estimate the size of the generated sound fields. Animal exposure modeling, which accounts for the movement and behavior of animals within the underwater sound fields, was then used to predict the number of marine mammals and sea turtles that may be exposed above acoustic thresholds during impact pile driving. The results of this modeling inform our approaches to minimizing and mitigating potential acoustic impacts to marine species, as described further in Section 8.2.5.3.

The ecological baseline developed for the Lease Area will be used to assess future changes that may result from the Project. Planned approaches to monitor marine mammal and sea turtle presence during survey and construction activities are described in the following section. Vineyard Offshore will work with agencies and relevant stakeholders to develop appropriate and practicable post-construction survey and monitoring techniques to document impacts to marine mammals and sea turtles. Monitoring techniques for these species typically include digital aerial surveys, boat surveys, and/or PAM specific to marine mammals; however, as new technologies become available, additional or alternative tools may also be used.

8.2.5.3 Minimizing Potential Impacts to Marine Mammals and Sea Turtles

Vineyard Offshore will continue our industry-leading efforts to develop measures that effectively avoid, minimize, and mitigate the risk of impacts to marine mammals and sea turtles from offshore wind development. This iterative and adaptive process will account for changing technologies, shifting patterns in species distribution, and lessons learned from other offshore wind projects in the Northeast. [redacted]

8.2.5.3.1 Preliminary Measures to Reduce Acoustic Impacts

Although it is premature to finalize monitoring and mitigation measures at this stage of the Project's development, several preliminary measures to reduce acoustic impacts to marine species have been identified. We expect to further refine these measures during the permitting process in coordination with relevant agencies and based on evolving federal regulations and guidance, including *BOEM and NOAA Fisheries' North Atlantic Right Whale and Offshore Wind Strategy*; relevant avoidance, minimization, mitigation, and monitoring measures that BOEM identifies through the New York Bight PEIS process; and relevant project design criteria from BOEM's programmatic consultation with NMFS for offshore wind project site characterization and site assessment activities (BOEM 2021a). The proposed measures described in this section, which focus on protection for marine mammals, also provide significant protection for sea turtles.

Temporal Constraints on Pile Driving: We do not intend to conduct pile driving between January 1 and April 30, when higher numbers of NARWs are expected to be present in the vicinity of the Lease Area. This will reduce potential acoustic impacts to NARWs and other species with similar seasonal presence in the region. NARWs are less likely to be present in the Lease Area than in the New England wind energy areas, so the need for and duration of a pile driving seasonal restriction will be confirmed based on further analysis of the most recent

[redacted]

NARW data during the permitting process, with input from scientific experts. To concentrate pile driving outside of pile driving seasonal restrictions, Vineyard Offshore may start (or continue) pile driving at night and/or in poor visibility conditions. To support activities in these conditions, we will implement alternative mitigation monitoring measures, as discussed further in this section.

Pile Driving Noise Attenuation Systems (NASs): Pile driving NASs currently under consideration include piling equipment that is optimized for sound reduction (e.g., Integrated Pile Installer), underwater noise abatement systems (e.g., AdBm encapsulated bubble sleeve), and/or bubble curtains. Various studies have demonstrated that these mitigation measures are capable of attenuating broadband sound levels by approximately 7 to 17 decibels (dB) (Buehler et al. 2015; Bellmann et al. 2020). We expect to select NASs that will achieve a reduction of 10 dB or greater; higher levels of attenuation may be achieved as technology continues to evolve.

Soft Start or Ramp-up Procedures: A soft start will be used at the beginning of pile driving events. A soft start uses an initial set of very low-energy strikes from the impact hammer, followed by a waiting period. Additional strike sets gradually increase in energy to what is needed to install the pile. This gradual increase in hammer energy (and correspondingly, sound levels) provides a "warning" to marine mammals and sea turtles in the area and allows time for them to move away before the noise intensity increases, avoiding any potential injury or impairment of their hearing abilities. Ramp-up procedures will similarly be followed at the initiation of certain high-resolution geophysical (HRG) surveys.

Use of Protective Zones, PSOs, and Acoustic Monitoring: Pre-start clearance and shutdown (i.e., exclusion) zones will be established to minimize potential impacts of underwater sound on marine mammals and sea turtles during pile driving and certain HRG survey activities (for acoustic sources operating below-specified frequencies based on species' hearing ranges). Pre-start clearance zones are typically zones in which marine mammal and sea turtle observations are made prior to starting an activity (e.g., pile driving). If an animal is observed entering or within the relevant species-specific clearance zone prior to initiating pile driving or specified HRG surveys, the activity will be delayed, and the observed animal will be allowed to leave the zone of their own volition.

A shutdown zone is an area surrounding pile driving or certain HRG survey activities that may be defined relative to Level A Harassment Zones (NMFS 2018) or other appropriate criteria. If a marine mammal or sea turtle is detected within or about to enter the applicable shutdown zone for that species after pile driving or HRG survey work has commenced, PSOs will request a shutdown of the activity. For pile driving, if the lead installation engineer determines that a shutdown would jeopardize the installation outcome, human safety, or vessel safety, the hammer energy would be reduced to the greatest extent possible. Pile driving will only be reinitiated after a shutdown once the pre-start clearance zones are confirmed to be clear of marine mammals or sea turtles for the defined minimum species-specific periods. The size of feasible pre-start clearance and shutdown zones is anticipated to be determined in consultation with BOEM and NMFS during the federal permitting process.

Qualified, trained PSOs will monitor these protective zones using visual aids (e.g., standard handheld and/or high-magnification binoculars) when necessary. In addition to visual monitoring, we will use a near-real-time underwater vocalization detection system (e.g., PAM) prior to, during, and post-pile driving to acoustically monitor the clearance and shutdown zones to aid in the detection of vocalizing protected species. The specifics of the PAM system will be determined in consultation with BOEM and NMFS. In addition to the PAM system and PSOs, should pile driving occur during times of limited visibility (e.g., darkness, fog), alternative monitoring technology (e.g., infrared thermal imaging cameras) will be used to monitor the protective zones and implement any necessary mitigation measures.

Sound Field Verification (SFV): To measure sound levels during pile driving and assess the efficacy of mitigation measures, we plan to conduct SFV. The specific SFV framework will be further developed in consultation with BOEM and NMFS, but sound levels are expected to be recorded for several piles for comparison with acoustic modeling results. In accordance with Section 2.2.11 of ORECRFP24-1, Vineyard Offshore will provide an Underwater Acoustic Monitoring Plan to NYSERDA that details how the SFV data will be collected and made available for use by third parties.

Other Measures: Vineyard Offshore will continue reporting protected species sightings to BOEM and NMFS and collaborating with these agencies to integrate practicable technology choices in equipment, mitigation, and monitoring (e.g., thermal cameras, NASs) to meet the necessary standards for permitting and successful consultations.

8.2.5.3.2 Preliminary Measures to Minimize Risk of Ship Strikes

Trained visual observers aboard each vessel will maintain a vigilant watch for all marine mammals and sea turtles, and vessel operators will slow down or maneuver their vessels, as appropriate, to avoid striking protected species. [redacted]

We will follow NMFS guidelines for vessel strike avoidance, including vessel speed restrictions and separation distances, that are applicable during site assessment, construction, and operations activities.[5] Based on current NMFS requirements in our IHA for survey activities, vessels must maintain, to the greatest extent possible, separation distances of greater than (>) 500 meters from any NARW or other ESA-listed whale, >100 m from all non-ESA-listed whales, and >50 m from all other marine mammals, with the exception of delphinids and pinnipeds that approach the vessel, in which case the vessel operator must avoid excessive speed or abrupt changes in direction. We will also continue to follow the standard vessel strike avoidance practices of turning away from any protected species, slowing down, and stopping our vessels to avoid striking any marine animals.

[redacted]

With respect to vessel speed restrictions, all vessels will comply with the final amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule at 50 Code of Federal Regulations (CFR) Part 224, once promulgated. All personnel working offshore will receive environmental training, stressing individual responsibility for marine mammal and sea turtle awareness and reporting as well as marine debris awareness.

8.2.6 Birds and Bats

8.2.6.1 Presence of Birds and Bats

8.2.6.1.1 Birds

The presence of marine and coastal birds in the Lease Area and surrounding waters is thoroughly evaluated in the Vineyard Mid-Atlantic COP. As further described in Attachment 8.2-2, the occurrence of birds in the New York Bight region is well-documented, with multiple studies providing important information on avian presence and abundance at a series of useful scales, such as: NYSERDA's (2021) Digital Aerial Baseline Surveys; NYSERDA's (2017) Birds and Bats Study; data from the Marine-life Data and Analysis Team[6] based at Duke University; and digital aerial surveys conducted by Empire Wind for adjacent Lease Area OCS-A 0512. A total of 22 bird species were detected in Lease Area OCS-A 0544 during the NYSERDA surveys and Lease Area OCS-A 0512 surveys, including sea ducks, phalaropes, auks, gulls, terns, loons, shearwaters, petrels, storm-petrels, and gannets. All the observed species were marine birds, although digital aerial surveys are not designed to detect nocturnal migrants and have difficulty detecting small migratory songbirds and shorebirds; thus, other non-marine migrating species may pass through the Lease Area.

Of the bird species that may pass through the vicinity of the Lease Area, the species of greatest concern are the four federally listed species (which are also state-listed as either threatened or endangered): roseate tern (*Sterna dougallii*), piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), and black-capped petrel (*Pterodroma hasitata)*. Of these four federally listed species, only black-capped petrels were observed in the Lease Area. Other species that may occur in the vicinity of the Lease Area include those listed at the state level as follows:

- **Species of Greatest Conservation Need:** American black duck (*Anas rubripes*), semipalmated sandpiper (*Calidris pusilla*), and saltmarsh sparrow (*Ammodramus caudacutus*)
- **Special Concern:** Osprey (*Pandion haliaetus*),[7] common nighthawk (*Chordeiles minor*), and common loon (*Gavia immer*)
- **Threatened:** Least tern (*Sternula antillarum*) and common tern (*Sterna hirundo*)

[6] See: Marine-life Data and Analysis Team (MDAT) Marine-life data to support regional ocean planning and management.

[7] Osprey have been proposed for removal from the state's list of species of special concern (NYSDEC 2019).

State-listed bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are not expected in the Lease Area given its distance from shore.

Federally listed species that have the potential to occur in the vicinity of the onshore infrastructure, as described in Section 7, include piping plover, red knot, roseate tern, and bald eagle (listed under the Bald and Golden Eagle Protection Act). Other species that have been observed in the vicinity of the Onshore Development Area include all of those that may occur near the Lease Area, as well as these additional species listed at the state level as follows:

- **Species of Greatest Conservation Need:** Northern bobwhite (*Colinus virginianus*), whimbrel (*Numenius phaeopus*), short-billed dowitcher (*Limnodromus griseus*), brown thrasher (*Toxostoma rufum*), bobolink (*Dolichonyx oryzivorus*), eastern meadowlark (*Sturnella magna*), rusty blackbird (*Euphagus carolinus*), prothonotary warbler (*Protonotaria citrea*), Kentucky warbler (*Geothlypis formosa*), bay-breasted warbler (*Setophaga castanea*), and Canada warbler (*Cardellina canadensis*)

- **Special Concern:** Eastern whip-poor-will (*Antrostomus vociferus*), black skimmer (*Rynchops niger*), American bittern (*Botaurus lentiginosus*), red-shouldered hawk (*Buteo lineatus*), red-headed woodpecker (*Melanerpes erythrocephalus*), horned lark (*Eremophila alpestris*), vesper sparrow (*Pooecetes gramineus*), seaside sparrow (*Ammospiza maritima*), and yellow-breasted chat (*Icteria virens*)

- **Threatened:** Pied-billed grebe (*Podilymbus podiceps*), least bittern (*Ixobrychus exilis*), northern harrier (*Circus hudsonius*), bald eagle, red knot, least tern, and common tern

- **Endangered:** Piping plover, black tern (*Chlidonias niger*), roseate tern, peregrine falcon (*Falco peregrinus*), and short-eared owl (*Asio flammeus*) (see Attachment 8.2-2).

[redacted] As part of the permitting process, we have undertaken a full assessment of onshore bird species and will work to protect nearby resources in coordination with NYSDEC and NYSOPRHP (see Section 6.2).

8.2.6.1.2 Bats

An assessment of the presence of bats in and around the Lease Area is provided in Attachment 8.2-2. There are nine species of bats known to be present in New York, six of which are year-round residents. The Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) are currently federally listed as endangered (USFWS 2022a), and the tricolored bat (*Perimyotis subflavus*) is proposed for listing (USFWS 2022b). Of these three,

only the northern long-eared bat and tricolored bat have the potential to occur in the vicinity of the Onshore Development Area and/or Offshore Development Area.

In general, acoustic and radio-tracking studies indicate low use of the offshore environment by cave-hibernating bats, and such use is likely limited to the fall migration period (Peterson et al. 2014; Dowling et al. 2017). The cave-hibernating northern long-eared bat is classified as endangered under the ESA and under New York State law. Although the range of the northern long-eared bat extends throughout the Northeast, occupancy modeling from the North American Bat Monitoring Program suggests a low probability of northern long-eared bat summer occupancy across all of Long Island. In addition, they are not expected to occur in the Lease Area due to their tree-roosting and foraging behaviors, which occur in forests within a few kilometers of roosting locations. Similarly, it is unlikely that other cave-hibernating bats, such as the eastern small-footed bat (*Myotis leibii*; a New York State species of special concern), little brown bat (*Myotis lucifugus*; a New York State species of special concern), tricolored bat (*Perimyotis subflavus*; proposed for listing as endangered under the ESA), or big brown bat (*Eptesicus fuscus*), would encounter the OWF during migration. The Indiana bat (*Myotis sodalis*) is listed as endangered under federal and state law, but its range does not extend to the Lease Area or Long Island. Although migratory tree bats such as the eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*) are detected more often in the offshore environment than cave-hibernating bats, exposure is likely to be limited to the migration period.

The northern long-eared bat and tricolored bat are expected to be the species of greatest concern given their endangered or proposed endangered status, their population decline due to White Nose Syndrome, and because the Onshore Development Area may include roosting or foraging habitat. Vineyard Offshore will work with the New York Natural Heritage Program as necessary to determine the onshore facilities' proximity to known roost trees or hibernacula. Conservation strategies for the northern long-eared bat and tricolored bat will likely be similar to those implemented for other endangered bats, such as the Indiana bat. We will adhere to new conservation strategies in consultation with federal and state regulators.

8.2.6.2 Methods to Evaluate Risks to Birds and Bats

The primary potential impact of the Project to birds is mortality or injury due to collision with the WTGs. As part of the Vineyard Mid-Atlantic COP, we performed avian assessments to determine the species' likelihood of exposure to the Lease Area (i.e., likelihood of occurrence) and their vulnerability to collision with WTGs and displacement. The exposure of birds to the Lease Area was assessed for each species and taxonomic group and categorized as minimal, low, medium, or high based on available literature and a semi-quantitative assessment of site-specific data (see Section 8.2.6.1). Next, relative vulnerability, or the degree to which a species is expected to be affected by the WTGs based on known behavioral responses to similar offshore developments, was assessed for marine birds using a scoring process. Exposure was assessed for each species and taxonomic group, where "exposure" is defined as the proportion of the seasonal or annual population that overlaps the Lease Area for a given species. Vulnerability was assessed for marine birds using a scoring process focused on documented avoidance behaviors, estimated flight heights, and other factors. Then, the exposure and

vulnerability assessments were combined to evaluate the risk to each species. For non-listed species, the risk assessment is provided at the population level, whereas, for federally listed species, the assessment provides information on an individual level because the loss of one individual from the breeding population has a greater likelihood of affecting a population than for non-listed species.

As with birds, the primary potential impact of the OWFs to bats is mortality or injury from collision with the WTGs. Given the distance of the Lease Area to the nearest coastline (approximately 24 miles), the overall exposure of bat species to the Lease Area is expected to be minimal to low; bat exposure is likely limited to a few individuals of migrating tree bats in the fall. Therefore, population-level risks from collision with WTGs are unlikely.

Potential exposure and impacts to birds and bats from the onshore facilities are expected to be limited. [redacted].

8.2.6.3 Measures to Minimize Risk to Birds and Bats

The OWF's location far offshore avoids and minimizes exposure to many birds and bats. The WTGs will be spaced far apart and have significant air gaps, which minimizes collision risk to marine birds given that many seabirds will fly below the rotor-swept zone. In particular, sea ducks are generally not considered vulnerable to collision (Furness et al. 2013), in part because they primarily fly below the rotor-swept zone. Anti-perching is incorporated into the design of the WTGs by using tubular support towers. To the extent practicable and in accordance with health and safety requirements, we will evaluate the feasibility of installing bird deterrents at WTGs that have been identified as having high use by birds.

To avoid attracting birds and bats (and thus reducing the risk of collision and mortality), Vineyard Offshore will reduce lighting to the extent practicable by using best management practices (e.g., using down-shield lighting or down-lighting) and adhering to federal regulations and BOEM guidance. During operations, we will use an aircraft detection lighting system (ADLS) or similar system that automatically activates all aviation obstruction lights on the WTGs and ESPs when aircraft approach the structures, subject to BOEM approval. The use of an ADLS will dramatically reduce the amount of time that the aviation obstruction lights are illuminated. [redacted]

[redacted] Ground disturbances will be temporary, and disturbed areas will be restored to their pre-existing condition. During the permitting process, we will consult with agencies to develop appropriate time-of-year restrictions for tree clearing, if needed, to avoid or minimize impacts to bats.

8.2.6.4 Approaches to Assess Impacts to Birds and Bats

The data sources described in Section 8.2.6.1 provide a baseline for post-construction monitoring. For the Lease Area, we will develop a framework for a post-construction monitoring program for birds. We plan to model the bird monitoring framework on the program developed for Vineyard Wind 1 while allowing for the flexibility to include new technologies, lessons learned, and agency and stakeholder input. The Vineyard Wind 1 monitoring framework includes (1) acoustic monitoring for birds and bats for at least two years post-construction; (2) installing Motus receivers on WTGs, supporting with upgrades or maintenance of two onshore Motus receiver stations, and providing up to 150 Motus tags to third-party avian researchers to track roseate terns and possibly common terns and/or nocturnal passerine migrants; (3) conducting pre- and post-construction boat surveys; and (4) conducting avian behavior point count surveys at individual WTGs for up to three years. By the time the Project is near construction, the Vineyard Wind 1 framework will have been implemented. The New York Bight PEIS is also identifying potential additional mitigation measures that may be required in the Lease Area.

We have installed a Motus Wildlife Tracking System on the meteorological buoy deployed in our Lease Area in May 2024 in coordination with USFWS's Offshore Motus network. During construction, operations, and decommissioning, we will report to BOEM and USFWS any dead or injured birds or bats found on vessels and structures in the Lease Area.

8.2.7 Fish, Invertebrates, and Their Habitats

8.2.7.1 Presence of Finfish, Invertebrates, and Their Habitats

We have a strong understanding of fish, invertebrates, and their habitats, including those of greatest concern, in the vicinity of the Lease Area and OECC. Using the wealth of existing data sources for the New York Bight region and a robust benthic survey within the Lease Area and OECC via benthic grab samples, underwater video, and geophysical survey techniques, we prepared comprehensive assessments of the presence of finfish, invertebrates, and their habitats in the Lease Area and surrounding waters as part of the COP (see Attachment 8.2-2).

Six federally listed fish species may occur off the northeast Atlantic coast in the vicinity of the New York Bight: shortnose sturgeon (*Acipenser brevirostrum*), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), Atlantic salmon (*Salmo salar*), giant manta ray (*Manta birostris*), oceanic whitetip shark (*Carcharhinus longimanus*), and scalloped hammerhead (*Sphyrna lewini*). Of these, only the Atlantic sturgeon is anticipated to potentially occur within the Lease Area and surrounding waters. [redacted]

[redacted]

An Essential Fish Habitat is designated for 40 species within the Lease Area and OECC, and no Habitat Areas of Particular Concern are located within either the Lease Area or OECC. According to our benthic analysis, the Lease Area and OECC are made up of primarily Soft Bottom habitat, with areas of Heterogeneous Complex habitat also present. No Complex or Large Grained Complex habitats were identified in the Lease Area or OECC.

8.2.7.2 Methods to Evaluate Risks to Fish, Invertebrates, and Their Habitats

The potential impact-producing factors that may affect finfish, invertebrates, and their habitats during the construction, operations, and/or decommissioning of the Project are seafloor disturbance and habitat modification, presence of structures, suspended sediments and deposition, entrainment and impingement, electromagnetic fields (EMFs), noise, artificial light, and survey gear use. The degree to which these impact-producing factors are likely to result in impacts to fish, invertebrates, and their habitats in the Lease Area or OECC was evaluated in assessments prepared for the COP. [redacted]

We have developed a benthic habitat monitoring plan framework and a preliminary fisheries monitoring plan for the Project; such monitoring may be part of regional monitoring efforts.

8.2.7.3 Measures to Minimize Risk to Fish, Invertebrates, and Their Habitats

Vineyard Offshore is considering several measures to reduce potential impacts on fisheries resources and other sensitive species. Generally, mitigation measures to protect marine mammals and sea turtles (see Section 8.2.5.3) also protect fish species. For example, pile driving noise will be mitigated through a soft start, which allows fish time to move away from the area, and we expect to select NASs that reduce sound levels by 10 dB or more. The WTGs and ESPs are widely spaced so that their foundations (and associated scour protection), along with cable protection for inter-array cables (if needed), only occupy a minimal portion of the Lease Area, leaving a vast majority of the sites undisturbed. The addition of foundations, scour protection, and cable protection (if required) may act as an artificial reef and provide habitat previously absent from the area.

As described further in Section 8.2.8, the offshore export cables will be sited to avoid and minimize impacts to sensitive habitats to the greatest extent feasible. Most impacts from cable installation will be temporary. [redacted] Additional measures to reduce impacts to fish, invertebrates, and their habitats will be determined based on knowledge gained in the field from other offshore wind projects and consultations with agencies and stakeholders during the permitting process.

8.2.7.4 Fisheries Research and Other Mitigation Measures

Vineyard Offshore will continue to evolve and refine its pre-, during-, and post-construction fisheries and benthic habitat monitoring methods to incorporate results from other offshore wind projects, to be compatible with or a part of regional science efforts, and to adopt advancements in other science and technology. We will continue to work with agencies and stakeholders to explore research opportunities and other measures to reduce potential impacts to fish, invertebrates, or their habitats. [redacted]

8.2.8 Considerations for Subsea and Overland Cables

Siting OECCs is an extremely complex endeavor that must account for a multitude of technical, environmental, commercial, and logistical constraints. From the outset, we have designed the OECC to avoid or minimize the length of cable through sensitive habitats, such as mapped hard and complex bottom, shellfish beds, critical habitat for ESA-listed species, artificial reefs, and submerged aquatic vegetation, to the extent feasible. We have reviewed and considered data provided in the New York State *Offshore Wind Cable Corridor Constraints Assessment* (Whitken and Shurling 2023). [redacted] Other constraints that were factored into the design of the OECC, such as water depths and geologic conditions, potential cable crossings, fisheries, navigation channels, and anchorage areas, are described in Sections 4.2 and 8.1.7.

The resulting OECC minimizes potential environmental impacts to sensitive habitats from cable installation, such as seafloor disturbance, suspended sediments, and deposition, which will be short-term and localized in nature. The intensity of any EMF generated by the offshore cables will be minimized by cable sheathing, the cables' burial depth, and/or cable protection (if needed). To further minimize impacts, we will microsite individual offshore export cable alignments within the OECC to avoid sensitive habitats (where feasible) using G&G survey data, but avoidance of all sensitive habitats is not always possible.[8] We will require our cable installation contractor(s) to prioritize the least environmentally impactful cable installation methods(s) and tool(s) that are practicable for each segment of cable. Our goal is to minimize the use of cable protection to the greatest extent possible through a careful routing assessment and the selection of the most appropriate cable burial tool(s) to achieve a sufficient burial depth, taking into account site-specific environmental conditions and cable properties.

Identifying landfall sites and onshore export cable routes is a similarly complex endeavor largely driven by Delivery Point availability. [redacted]

8.2.9 Project Decommissioning

The Project's decommissioning will occur approximately 30 years after it achieves commercial operation. Based on current regulations and our lease agreement, Vineyard Offshore expects to consult with BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) prior to that time and submit a Decommissioning Application to BSEE for review and approval. This process will include an opportunity for public comment and consultation with agencies (including relevant New York State agencies) and stakeholders. Upon receipt of the necessary BSEE approvals and any other required permits, Vineyard Offshore would implement the approved Decommissioning Application to remove offshore components.

The facilities will be decommissioned in accordance with the Decommissioning Application, lease agreement stipulations, and 30 CFR Part 285. As currently envisioned, the decommissioning process will be the reverse of the installation process. The WTG, ESP, and foundation components will be removed, shipped to shore, and properly disposed of or

[8] Route engineers must develop technically viable cable alignments that avoid steep slopes, provide suitable water depths for available cable installation vessels, enable feasible cable turning radii, avoid high concentrations of boulders or very stiff sediments, avoid magnetic anomalies, maintain a sufficient distance between cables, avoid crossing existing cables to the extent possible, and cross existing cables perpendicularly (where crossings are necessary).

recycled (see Section 4.5 for information about component reuse and recycling). Depending on input from agencies and relevant stakeholders, the offshore cables, any scour protection, and any cable protection may be removed or left in place if authorized by BOEM. Attachment 8.1-4 outlines the general decommissioning concept and procedures for each Project component based on the technology that exists today. However, we will ultimately use the latest technologies and logistical developments in the offshore wind industry that are available at the time of decommissioning, which may result in other decommissioning methods that are more efficient and further minimize environmental impacts.

Environmental Mitigation Plan for

Excelsior Wind

Version 1.0

Prepared pursuant to [contract number, date (TBD)]

with

New York State Energy Research and Development Authority

Albany, NY

Prepared by

Vineyard Offshore

200 Clarendon St., 18th Floor
Boston, MA 02116

September 9, 2024

Record of Revision		
Revision Date	**Description of changes**	**Revision on pages**
[date]	[Original issue]	[page(s)]

Project Information and Contacts		
Name/Title	**Role**	**Contact Information**
Project Development		
Nora DeDontney, Vineyard Mid-Atlantic Development Director	Direct and oversee Project development activities in Lease Area OCS-A 0544	NDeDontney@vineyardoffshore.com
Permitting and Environmental Affairs		
Esther Siskind, Vineyard Mid-Atlantic Federal Permitting Lead	Lead federal permitting activities for Lease Area OCS-A 0544; secondary E-TWG representative	ESiskind@vineyardoffshore.com
Scott Salmon, Senior Permitting Manager (New York)	Direct and oversee state permitting activities in New York	SSalmon@vineyardoffshore.com
Elizabeth Marsjanik, Senior Manager, Environmental Affairs	Primary E-TWG representative	EMarsjanik@vineyardoffshore.com
Community Engagement		
Andrea Bonilla, Senior Manager of External Affairs (New York)	Direct and oversee community engagement and public affairs activities in New York	ABonilla@vineyardoffshore.com
Fisheries and Other Marine Users		
Crista Bank, Senior Manager, Fisheries	Lead fisheries contact; primary F-TWG representative	CBank@vineyardoffshore.com
Emmie Page, Fisheries Liaison	Fisheries Liaison for Lease Area OCS-A 0544; secondary F-TWG representative	EPage@vineyardoffshore.com
Jeannot Smith, Marine Liaison Officer	Lead liaison for non-fisheries mariners	JSmith@vineyardoffshore.com

Links to project information:

Project website: https://www.vineyardoffshore.com/

Fisheries website: https://www.vineyardoffshore.com/fishermen

Table of Contents

Tables

1 Environmental Mitigation Plan Summary

1.1 Overall Philosophy and Principles

This section should describe the overall philosophy and principles the Developer will follow to avoid, minimize, mitigate, restore, and offset (e.g. net positive impact) potential environmental impacts.

The Environmental Mitigation Plan (EMP) presented herein applies to Excelsior Wind (the "Project"), which includes a 1,350 megawatt Offshore Wind Generation Facility (OWF) that will be installed in Lease Area OCS-A 0544 (the "Lease Area").

Vineyard Offshore is committed to developing, constructing, operating, and decommissioning well-sited offshore wind projects with minimal environmental impact. For Vineyard Wind 1, the nation's first commercial-scale offshore wind project, we pioneered a successful approach that prioritized avoiding, minimizing, or mitigating potential impacts whenever possible. We will continue our industry-leading efforts for the Project to proactively conserve and protect threatened and endangered species while considering changing technologies, best available data, and lessons learned from other offshore wind projects.

As the Project moves forward, we will continue to invest considerable time and resources to identify and employ practicable and appropriate measures that afford the highest levels of environmental protection while maintaining Project viability. This data-driven process will incorporate the experience gained from Vineyard Wind 1 as well as other offshore wind projects. We will also continue working closely with agencies and stakeholders to understand their concerns regarding the potential environmental impacts of offshore wind projects; incorporate their feedback into Project design and siting measures; and develop, trial, and implement innovative environmental protection measures.

1.2 Overall Approach to Incorporating Data and Stakeholder Feedback

This section should describe how the Developer will use research, data, and stakeholder feedback to update the EMP and support decision-making throughout the life cycle of the project (preconstruction, surveys, site design, construction, operations, and decommissioning).

Vineyard Offshore will rely on research, data, and stakeholder feedback to update this EMP and to develop, construct, and operate the Project following the mitigation hierarchy. In line with this commitment, Vineyard Offshore will take the following actions:

- Vineyard Offshore will seek consultation and coordinate with relevant stakeholders.
- Vineyard Offshore will review existing research and data and seek input from stakeholders regarding data gaps to inform decisions made throughout the Project's lifecycle.
- Vineyard Offshore will review and seek input from stakeholders on proposed and conducted survey rationales and methodologies, as well as design, construction and operation, and decommissioning plans for the Project.
- To the extent that the timeline allows, pre- and post-construction monitoring will be designed in consultation with stakeholders to improve the understanding of the impacts of offshore wind energy development and operations on wildlife.

- This EMP will be refined through an iterative and adaptive process that accounts for changing technologies, expanding information about potentially impacted species, and lessons learned from other offshore wind projects in the Mid-Atlantic and Northeast.
- Vineyard Offshore will update this EMP to reflect the Project as it evolves.

1.3 Existing Guidance and Best Practices that Will Be Followed

This section should present a list of existing guidance documents, publications, tools, and/or plans that will be followed to support the EMP. Include links, if available, for all references.

- Vineyard Offshore will continue to follow and implement best practices that are appropriate and relevant to the Project, such as the following:
    - Bureau of Ocean Energy Management's (BOEM's) (2020a) *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)—Version 4.0*)
    - BOEM's (2023a) FINAL Information Needed for Issuance of a Notice of Intent (NOI) Under the National Environmental Policy Act (NEPA) for a Construction and Operations Plan (COP) ("NOI-Checklist")
    - BOEM's (2020b) "Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Outer Continental Shelf Pursuant to 30 CFR Part 585"
    - BOEM's (2019a) "Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585"
    - BOEM's (2019b) "Guidelines for Providing Information on Marine Mammals and Sea Turtles for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585"
    - BOEM's (2023b) "Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585"
    - Other related BOEM guidelines/guidance documents found on their Guidance Portal
    - National Marine Fisheries Service's (NMFS's) (2018) *2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0)*
    - BOEM's (2021a) "Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection" (established through the programmatic consultation completed by NMFS's Greater Atlantic Regional Fisheries Office on June 29, 2021 [revised November 2021])
    - Best practice guidance tools that have been or may be developed by the New York State Energy Research and Development Authority's (NYSERDA's) Environmental Technical Working Group (E-TWG) and Fisheries Technical Working Group (F-TWG)
    - Guidelines developed by the Regional Wildlife Science Collaborative for Offshore Wind (RWSC), the Responsible Offshore Science Alliance (ROSA), and other regional monitoring organizations, such as ROSA's (2021) *Offshore Wind Project Monitoring Framework and Guidelines*
- Vineyard Offshore anticipates consulting additional publications, tools, and plans for the Project, including those listed in Sections 4.1, 5.1, and 6.1.

- Vineyard Offshore will also build on the lessons learned and critical hands-on experience gained from developing, permitting, constructing, and operating the Vineyard Wind 1 project.

2 Communications and Collaboration Approach

2.1 Overview and Communication Plan Objectives

This section should provide an overview of the communication plan and objectives and its importance in environmental mitigation.

Vineyard Offshore's communication efforts with stakeholders interested in environmental issues prioritize information sharing, soliciting feedback on the design and execution of the Project, and supporting an efficient and timely permitting process.

- Vineyard Offshore will continue to seek methods and processes to allow for a two-way flow of information between key stakeholders and developers, specifically highlighting how we use this feedback to inform our decision making.
- Vineyard Offshore will continue to provide updates to environmental stakeholders in an appropriate manner that can be easily accessed and widely distributed, including providing Semi-annual Progress Reports that are posted on BOEM's website.
- Vineyard Offshore will continue to actively engage and communicate with stakeholders; foster, build, and maintain trusted relationships; work to better understand and address concerns; and clearly communicate the reasons behind the decisions we make.
- Vineyard Offshore's communication plans and objectives will evolve throughout the lifecycle of the Project to ensure effective communication with a range of stakeholders and address stakeholder fatigue wherever possible.

2.2 Project Environmental Staff, Responsibilities, and Contact Information

This section will provide information on project environmental staff, their role(s), and contact information. The list should provide stakeholders with an understanding of who should be contacted for a particular issue or question. It will also include links to the project website so readers know where to find additional information.

Project Information and Contacts		
Name/Title	**Role**	**Contact Information**
Project Development		
Nora DeDontney, Vineyard Mid-Atlantic Development Director	Direct and oversee Project development activities in Lease Area OCS-A 0544	NDeDontney@vineyardoffshore.com
Permitting and Environmental Affairs		
Esther Siskind, Vineyard Mid-Atlantic Federal Permitting Lead	Lead federal permitting activities for Lease Area OCS-A 0544; secondary E-TWG representative	ESiskind@vineyardoffshore.com
Scott Salmon, Senior Permitting Manager (New York)	Direct and oversee state permitting activities in New York	SSalmon@vineyardoffshore.com

Elizabeth Marsjanik, Senior Manager, Environmental Affairs	Primary E-TWG representative	EMarsjanik@vineyardoffshore.com
Community Engagement		
Andrea Bonilla, Senior Manager of External Affairs (New York)	Direct and oversee community engagement and public affairs activities in New York	ABonilla@vineyardoffshore.com
Fisheries and Other Marine Users		
Crista Bank, Senior Manager, Fisheries	Lead fisheries contact; primary F-TWG representative	CBank@vineyardoffshore.com
Emmie Page, Fisheries Liaison	Fisheries Liaison for Lease Area OCS-A 0544; secondary F-TWG representative	EPage@vineyardoffshore.com
Jeannot Smith, Marine Liaison Officer	Lead liaison for non-fisheries mariners	JSmith@vineyardoffshore.com

Project website: https://www.vineyardoffshore.com/

Fisheries website: https://www.vineyardoffshore.com/fishermen

2.3 Identification of Stakeholders

This section should describe the process by which stakeholders relevant to environmental issues will be identified and classified by stakeholder group.

Vineyard Offshore regularly communicates with a wide variety of stakeholders and will continue to identify stakeholders relevant to both onshore and offshore environmental issues through the following actions, among others:

- Participate in federal, state, and regional environmental and fisheries technical working groups, advisory boards, councils, and commissions, including the E-TWG, the F-TWG, RWSC, ROSA, and the New York Offshore Wind Alliance.
- Conduct community and stakeholder engagement activities and engage in Project partnerships, particularly in New York.
- Continue and expand environmental engagement efforts as the Project moves through the permitting process.
- Continue to consult with relevant federal and state agencies.
- Continue to implement stakeholder engagement strategies outlined in Vineyard Offshore's Stakeholder Engagement Plan (SEP), Fisheries Communication Plan (FCP), and Native American Tribes Communication Plan.
- Maintain stakeholder lists, classify stakeholders by stakeholder group where appropriate, and track communications on an internal basis.

2.4 Participation in Stakeholder and Technical Working Groups

2.4.1 Communication with the E-TWG

This should describe the communication and collaboration approach with members of the E-TWG and consultations.

- Vineyard Offshore will continue to actively participate in and dedicate Project-specific technical resources to the E-TWG. Vineyard Offshore notes that our staff has been actively engaged in the E-TWG since its formation. Project updates will be provided at appropriate intervals.
- To the extent practicable, Vineyard Offshore will work with the E-TWG and attend E-TWG meetings and workshops, including State of the Science.
- Vineyard Offshore has identified specific individuals to serve at least one-year terms in the role of primary and secondary core members.
- Vineyard Offshore will work with NYSERDA to plan and host Project-specific EMP consultations.

2.4.2 Communication with Other New York State Agencies

This should describe communication with New York State agencies during each phase of the project.

- Vineyard Offshore has already communicated with New York State agencies, including several Consulting State Agencies, during the development of the Project to inform siting and design measures as well as permitting plans and timelines.
- Vineyard Offshore will communicate with Consulting State Agencies about the Site Assessment Plan and the Vineyard Mid-Atlantic COP and as we prepare New York State permit applications, including meeting with Consulting State Agencies at reasonable times and intervals, to attempt to resolve any identified issues prior to construction.
- Vineyard Offshore will engage with New York State agencies on evolving Project design and potential mitigation and monitoring measures.
- Vineyard Offshore will continue to meet with New York State agencies, including Consulting State Agencies, at reasonable times and intervals, during the construction and operations phases of the Project.
- Vineyard Offshore has developed communication plans, as required by our BOEM lease agreement, that will guide communication and engagement activities with certain stakeholder groups, including New York State agencies.

2.4.3 Communication with Other Stakeholder and Working Groups

This should describe any relevant participation with other stakeholder groups that would help inform the EMP.

- Vineyard Offshore will continue to collaborate with other regulatory agencies, academic and research institutions, environmental non-governmental organizations, and other stakeholder groups and will continue to maintain memberships and participate in collaborative efforts. We are a member of, actively participate in, and/or attend meetings for the following technical working groups, advisory boards, councils, and commissions:
    - RWSC

- ROSA
- NYSERDA's E-TWG
- NYSERDA's Environmental Justice Technical Working Group (EJ-TWG)
- NYSERDA's F-TWG
- International Council on Exploration of the Sea (Senior Manager, Fisheries [FM] is member of Working Group on Offshore Wind Development and Fisheries)
- Massachusetts Fisheries Working Group on Offshore Wind Energy
- Massachusetts Habitat Working Group on Offshore Wind Energy
- Massachusetts Ocean Advisory Committee
- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council

- Vineyard Offshore intends to maintain these relationships and develop new partnerships in connection with the Project, particularly in New York.
- Vineyard Offshore expects that further host community and Disadvantaged Community outreach and communication efforts, such as expanding our local staff and community representatives to conduct outreach, community meetings, and open houses, will lead to the development of partnerships and initiatives that may help inform this EMP.

2.4.4 Communication and Collaboration with Other Developers

This should describe any relevant participation and collaboration with other developers in the offshore space, with a focus on communication and collaboration with adjacent leaseholders. This may include but is not limited to shared research efforts, coordination of survey methods, or standardization of navigational and safety protocols.

- Vineyard Offshore will seek to maximize the impact of research efforts such as data collection, methodology, analysis, and dissemination by collaborating with other developers, particularly those in adjacent lease areas, taking on similar initiatives.
- Vineyard Offshore will continue to collaborate with other developers in relation to streamlining communications to reduce stakeholder fatigue, sharing data, and supporting the sustainable development of the offshore wind industry. We will also continue to participate in regional monitoring organizations (e.g., ROSA and RWSC) and agency-led efforts to standardize scientific methods, surveys, and monitoring plans across lease areas.
- BOEM's (2024) Programmatic Environmental Impact Statement (PEIS) process will continue to serve as an opportunity for Vineyard Offshore to collaborate with other developers.

2.5 Communication Methods and Tools by Phase

This section should describe the communication and outreach methods and tools that will be employed for each stakeholder group during each phase of the project.

Recognizing that stakeholder groups have different needs when it comes to receiving information and participating in the project development process, Vineyard Offshore employs an array of methods to

disseminate information and engage stakeholders. We will continually evaluate and adapt our approach to ensure the effectiveness of our efforts. The following table includes a subset of the communication methods and tools in our stakeholder engagement toolkit. Additional communication methods and tools are described in the SEP.

Proposed Outreach Method/Tools	Phase*			
	1	2	3	4
Vineyard Offshore website	X	X	X	X
Social media, digital advertisements, newsletters, press releases, videos	X	X	X	X
Newspaper, radio, podcast, and television interviews	X	X	X	X
Participation in the E-TWG, the EJ-TWG, the F-TWG, and similar federal, state, and regional environmental, wildlife, and fisheries technical working groups, advisory boards, councils, and commissions; responding to data and site access requests	X	X	X	X
Hiring specialized fisheries staff, consultants, and representatives (e.g., FM, Fisheries Liaisons, Fisheries Representatives, and Offshore Fisheries Liaisons) who will implement the FCP	X	X	X	X
Conducting Long Island office hours open to the public	X	X	X	X
Virtual and in-person meetings and events, phone calls, emails	X	X	X	X
Project partnerships, attending/sponsoring/tabling at conferences and events, formal and informal coalition building, site visits, focus groups, informal networking	X	X	X	X
**Phase: 1: Survey/Design; 2: Construction; 3: Operations; 4: Decommissioning*				

3 Supporting Other Research

3.1 Support of Collaborative Research

This section should describe how opportunities for developing or investing in collaborative research with the environmental community to collect ecological data will be identified and undertaken. The description must account for the need to coordinate with members of the E-TWG during data gathering and assessment.

- Vineyard Offshore expects to meet with RWSC prior to commencing research to ensure that the proposed work is consistent with Science Plan recommendations.
- Vineyard Offshore will provide annual progress updates to the relevant RWSC expert subcommittee(s) by attending and providing a presentation during regularly scheduled subcommittee meetings.
- At Project kickoff, Vineyard Offshore will submit Project information to the RWSC Offshore Wind & Wildlife Database, review its accuracy, and provide updates every six months.
- At Project kickoff, or as soon as information is known, Vineyard Offshore will submit coordinates of any sensors, sampling stations, or other research activities to the appropriate RWSC subcommittee for inclusion in the Research Planning Map.
- Vineyard Offshore will continue to identify opportunities to support collaborative research through the engagement processes described previously and in the sections that follow.

3.2 Handing and Processing Requests

This section should describe how requests for coordination with third-party supported scientists will be

processed - including providing reasonably requested Project data and access to the Project area for independent scientists examining environmental sensitivities and/or the impacts of offshore wind energy development on the environment for the purpose of publication in peer-reviewed journals or other scientifically rigorous products.

- Vineyard Offshore will coordinate with third-party scientists regarding the provision of data and site access, and we will review any requests on a case-by-case basis. All requests will be considered and discussed with the requestor and will not be unreasonably denied.
- With the exception of temporary safety buffer zones established around work areas, third-party research vessels will be permitted to transit through and within the Lease Area.

3.3 Data Availability

This section should describe how data will be made available in accordance with Section 2.2.8 of the RFP.

- Vineyard Offshore has made or intends to make non-proprietary environmental and fisheries data publicly available in a format and manner best suited for efficient distribution.
- Much of the data will be publicly available through the federal and state permitting processes, as well as reports or academic publications that result from survey or monitoring work, and will be readily accessible to stakeholders. We proactively publish our fisheries research on our Fisheries & Mariners webpage.
- Where practicable, we will disseminate raw environmental data to the most appropriate database(s), such as those recommended in NYSERDA's (2021a) *Wildlife Data Standardization and Sharing: Environmental Data Transparency for New York State Offshore Wind Energy*, as soon as feasible following internal quality assurance and quality control (QA/QC).
- Vineyard Offshore will continue working with agencies, stakeholders, and other offshore wind developers to find cost-effective and user-friendly ways to streamline and standardize available data across lease areas.
- Vineyard Offshore will provide a Data Management and Availability Plan to NYSERDA detailing how site and environmental data will be made available for use by third parties on an ongoing basis as soon as practicable after collection and QA/QC.

3.4 Proposed Restrictions

This section should describe any restrictions on data provision or access that may be required to protect trade secrets or maintain site security.

- Vineyard Offshore will seek to explain why identified data types are considered commercially sensitive.
- In certain instances, Vineyard Offshore may impose restrictions on data provision or the deployment of research equipment (e.g., buoys, environmental sensors, telemetry receivers, cameras) within the Lease Area, offshore export cable corridor (OECC), and on our facilities to protect proprietary and/or competitively sensitive information, maintain site security, and ensure safety, etc.
- Vineyard Offshore notes that some data, though not proprietary, may be time consuming or costly

to produce depending on the specific request and the primary format in which the data were collected. Vineyard Offshore will work to advance such requests but also hopes that regional monitoring organizations will make accessing data from all developers easier and more standardized to, at least in part, address this issue.

3.5 Financial Commitment for Third-party Research

This section should provide a level of financial commitment, if elected, that will be appropriated to leverage third-party environmental research funding, including federal or State-supported research. These financial commitments are outside those identified in Section 2.2.7 of the RFP and beyond those identified to fulfill state and federal regulatory permitting requirements.

- Vineyard Offshore plans to carefully consider all funding opportunities that arise through regional monitoring organizations (e.g., RWSC and ROSA). These groups will be raising funds from other entities and, with support from offshore wind developers, will be able to expand the scope and impact of their efforts to better understand the potential environmental effects of offshore wind energy development.

3.6 Proposed or Existing Commitments and Collaborations

This section should describe proposed or existing commitments and collaborations with third- party researchers in support of monitoring activities and assessing impacts.

- Vineyard Offshore is firmly committed to supporting regional studies and other independent environmental research.
- Vineyard Offshore plans to develop new partnerships in connection with the Project, particularly in New York, with an expected focus on supporting independent research and regional studies.

4 Proposed Mitigation of Impacts to Marine Mammals and Sea Turtles

4.1 Baseline Characterization

4.1.1 Available Information

Describe existing key literature and datasets that are available for baseline characterization.

Numerous data sources characterize the distribution and abundance of marine mammals and sea turtles potentially affected by the Project. Key sources include the following:

- NMFS Marine Mammal Stock Assessment Reports
- Atlantic Marine Assessment Program for Protected Species surveys
- Duke University Habitat-based Cetacean Density Models for the US Atlantic (Roberts et al. 2016, 2023, 2024; Roberts 2022)
- New York Bight Whale Monitoring Program aerial and acoustic surveys
- Wildlife Conservation Society/Woods Hole Oceanographic Institution New York Bight Acoustic Buoys
- NYSERDA's (2021b) *Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy: Spatial and Temporal Marine Wildlife Distributions in the New York Offshore Planning Area, Summer 2016–Spring 2019: Volume 1: Methods, General Results, Limitations, and Discussion*

- NYSERDA's (2017d) *New York State Offshore Wind Master Plan: Marine Mammals and Sea Turtles Study*
- North Atlantic Right Whale Consortium (NARWC) Database
- The North Atlantic Right Whale Sighting Survey and Right Whale Sighting Advisory System
- NMFS Sea Turtle Stranding and Salvage Network
- Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) Model Repository
- Northeast Ocean Data Portal
- BOEM studies and environmental assessments for other offshore wind projects, such as:
    - BOEM's (2023c) *Empire Offshore Wind Final Environmental Impact Statement, Volume 1*
    - BOEM's (2023d) *Ocean Wind 1 Final Environmental Impact Statement*

4.1.2 Data Being Collected

Describe data collected, or will be collected, to support baseline characterization.

- BOEM has prepared a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the Lease Area. This will help to inform the baseline characterization of marine mammals and sea turtles (BOEM 2024).
- Using the wealth of existing information on marine mammals and sea turtles in the New York Bight region (see Section 4.1.1), we have prepared an initial assessment of the occurrence of marine mammals and sea turtles in the vicinity of the Lease Area. This initial assessment will be refined as part of the Vineyard Mid-Atlantic COP through a detailed review of available data, integration of BOEM's analysis in the PEIS, and consultations with agencies and stakeholders.
- Vineyard Offshore is conducting hydroacoustic modeling to assess marine mammal impacts from wind turbine generator (WTG) foundation installation and support the COP and future agency consultations.
- Vineyard Offshore is collecting additional information on the presence and abundance of marine mammals and sea turtles via opportunistic observations by Protected Species Observers (PSOs) that occur during geophysical and geotechnical (G&G) surveys within the Lease Area.

4.2 Species at Risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the 39 marine mammal species that have been documented in the Western North Atlantic Outer Continental Shelf (OCS) region, which encompasses the Lease Area and OECC, five Endangered Species Act (ESA)-listed species are the species of greatest concern given their biology, habitat use, low abundance, ESA status, existing threats, and potential to occur at least seasonally in and around the Lease Area and OECC. These are the North Atlantic right whale (NARW), sperm whale, fin whale, blue whale, and sei whale.
    - Vineyard Offshore notes that the protection of the critically endangered NARW is of utmost concern to us as well as many other stakeholders. Vineyard Offshore has and will continue to

engage with agencies and stakeholders on ways to further monitor and protect this species as the Project moves forward.

- Four species of sea turtles are likely to occur in the Western North Atlantic OCS region: loggerhead sea turtles, Kemp's Ridley sea turtles, leatherback sea turtles, and green sea turtles. In light of sea turtles' status under the ESA and their occurrence in and around the Lease Area and OECC, all four species of sea turtles are considered species of concern.
- Although Vineyard Offshore has heightened concern regarding the species previously identified, we treat all marine mammals and sea turtles with great concern and will implement protective measures for all marine mammals and sea turtle species.

4.3 Potential Impacts and Mitigation Measures by Phase

The table below should list the potential impacts to marine mammals and sea turtles and proposed mitigation measures. To this end, a description of proposed measures to minimize the impacts of sound on marine mammals and sea turtles during all phases to Project development should be included. In addition, provide a description of the anticipated pre- and post- construction survey techniques to establish an ecological baseline and changes to that baseline within the Project site; the minimum size of exclusion zone intended to be monitored during geophysical surveys and construction; planned approaches to understanding marine mammal and sea turtle presence and absence within development site exclusion zone during site assessment and construction (e.g., a combination of visual monitoring by protected species observers and passive acoustic monitoring, the use of night vision and infra-red cameras during nighttime activities, etc.); proposed temporal constraints on construction activities and geophysical surveys with noise levels that could cause injury to harassment in marine mammals (e.g., seasonal restrictions during periods of heightened vulnerability for priority species; commencing activities during daylight hours and good visibility conditions, dynamic adjustments following the detection of a marine mammal); and proposed equipment and technologies the Developer would use to reduce the amount of sound at the source, if any.

Vineyard Offshore has identified preliminary measures to avoid, minimize, and mitigate potential impacts to marine mammals and sea turtles from the Project. However, it is premature to finalize monitoring and mitigation measures at this stage of the Project's permitting process, which necessarily entails a thorough assessment of potential impacts and subsequent finalization of appropriate and practicable mitigation measures to address impacts. This multi-year iterative and adaptive process accounts for changing technologies, expanding information about marine species, and lessons learned from other offshore wind projects in the Mid-Atlantic and Northeast.

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
Underwater noise impacts from geophysical survey equipment	• Exclusion, clearance, and monitoring zones will be maintained around noise-generating activities (for high-resolution geophysical [HRG] survey acoustic sources operating below specified frequencies based on species' hearing ranges) to help monitor and mitigate potential noise-related effects on marine mammals and sea turtles. The size of these zones will be based on the best available science and applicable thresholds and will be determined in consultation with BOEM and NMFS. • Monitoring during noise-generating activities will be done through an integrated monitoring approach, including the use of passive acoustic monitoring (PAM), NMFS-approved PSOs, and other proven technologies, as appropriate, to the extent practicable and in compliance with federal regulations and our permits. • Because of extensive BOEM survey requirements, survey work must occur on a 24/7 basis to permit the Project in a timely and efficient manner. It is currently best practice to use alternative technologies during low-visibility conditions to protect marine mammals and sea turtles. Vineyard Offshore will consider opportunities to reduce nighttime survey work, where possible. • Shutdown and ramp-up procedures will be employed for certain HRG surveys.	X	X	X	X
Underwater noise impacts from construction and installation activities	• Vineyard Offshore will use noise attenuation technologies to reduce sound from pile driving of foundations (if such methods are used). • The need for and duration of a pile driving seasonal restriction to protect NARWs will be based on further analysis of the most recent NARW data during the permitting process, with input from scientific experts. • A soft start will be used at the beginning of pile driving. • Monitoring during pile driving activities will be done through an integrated monitoring approach, including the use of PAM, NMFS-approved PSOs, and other proven technologies, as appropriate, to		X		

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	the extent practicable. • As practicable, pre-start clearance and shutdown (i.e., exclusion) zones will be established during pile driving. The size of feasible pre-start clearance and shutdown zones for pile driving will be determined using acoustic modeling in consultation with BOEM and NMFS during the federal permitting process. • Vineyard Offshore will not commence impact pile driving for foundation installation during poor visibility conditions such as darkness, fog, and heavy rain unless an alternative mitigation monitoring plan has been approved by the relevant federal agencies.				
Vessel strikes on marine mammals	• Trained visual observers aboard each vessel will maintain a vigilant watch for all marine mammals and sea turtles, and vessel operators will slow down or maneuver their vessels, as appropriate, to avoid striking protected species. • Vineyard Offshore will follow NMFS guidelines for vessel strike avoidance, including vessel speed restrictions and separation distances, that are applicable at the time of construction and operations.[2] • Vineyard Offshore will ensure that all vessel personnel are trained regarding animal identification and protocols when sightings occur. • Vineyard Offshore will provide reference materials onboard Project vessels for the identification of marine mammals and sea turtles.	X	X	X	X
Electromagnetic fields (EMFs), resulting in potential disturbance to marine mammals, sea turtles, and/or their prey resource	• Vineyard Offshore will use proper shielding to reduce EMF impacts. This can be achieved through sheathing and burial of cables; where sufficient burial depth cannot be achieved, the cables can be covered by cable protection (which would shield EMFs). • Vineyard Offshore will conduct EMF modeling and assessments that could be used to identify potential mitigation requirements as part of the permitting process.		X X	X	

**Phase: 1: Survey/Design; 2: Construction; 3: Operations; 4: Decommissioning*

Notes:

1. The proposed measures described in this table are preliminary in nature and subject to review and approval

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.					
2. *Except where following these requirements would put the safety of the vessel or crew at risk*					

4.4 Monitor for Potential Impacts During Each Phase

Describe how potential impacts will be monitored on marine mammals and sea turtles during each phase of physical work for the Project (site assessment, construction, operation, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

- Vineyard Offshore will seek to collaborate with regulatory agencies and stakeholder groups to identify research needs and opportunities.
- PSO monitoring during pile driving and certain high-resolution geophysical (HRG) surveys will follow standard monitoring protocols.
- During the Project, observations of NARWs and dead, entangled, or distressed marine mammals will be communicated to federal authorities in accordance with applicable permit conditions.
- Vineyard Offshore will work with agencies and stakeholders to develop appropriate and practicable post-construction (and eventually, decommissioning) survey or monitoring techniques to document any observed impact to marine mammals and sea turtles. The monitoring measures will be informed by those that have been put in place for Vineyard Wind 1 and other offshore wind projects.

4.4.1 Assess and Quantify Changes

Describe how changes to environmental resources will be quantified using statistically sound methods.

- Ideally, specific questions and focal taxa will be chosen for the Project either based on site-specific risk assessment or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.
- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.
- Vineyard Offshore will assess the most appropriate statistical tools to use and will incorporate lessons learned from monitoring being conducted for Vineyard Wind 1 and other offshore wind projects and research efforts off the East Coast.

4.4.2 Address Data Gaps

Describe how data gaps will be addressed.

- Extensive survey and monitoring work has been (and continues to be) conducted to characterize the distribution and abundance of marine mammals and sea turtles in the New York Bight region.

- Vineyard Offshore will work with stakeholders, including regulatory agencies, the E-TWG, and local groups, in the design phase of the Project (and throughout the permitting process) to identify data gaps that may be addressed through surveys or permitting applications.
- Vineyard Offshore collaborated with Wildlife Conservation Society to site a passive acoustic monitoring (PAM) recorder in the Lease Area in 2024, as part of a NYSERDA-funded PAM project.
- Broader concerns about data gaps are anticipated to be identified and addressed through regional monitoring organizations, such as RWSC and ROSA, where Vineyard Offshore is an active member.

4.5 Strategies for Developing Alternate Protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore habitat for impacted marine mammals and sea turtles in an alternative location.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know whether offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.
- As necessary, Vineyard Offshore will explore this topic further in consultation with regulatory agencies, as well as the E-TWG and relevant stakeholders.

5 Proposed Mitigation of Impacts to Birds and Bats

5.1 Baseline Characterization

Describe how baseline data will be established on the presence of bird and bat assemblages, temporal and spatial use of the site by key species within the area of the proposed Project.

5.1.1 Available Information

Describe key existing literature and datasets that are available for baseline characterization.

The occurrence of birds in the New York Bight region and surrounding waters is well-documented, with multiple studies providing important information on avian presence and abundance at a series of useful scales. Additionally, a growing number of studies exist on the presence of bats in and around the New York Bight region. Existing studies and reports that contribute to the available information related to birds and bats occurring near the Project include the following:

- Marine-life Data and Analysis Team (MDAT) marine bird relative density and distribution models
- Northwest Atlantic Seabird Catalog

- *Tracking Offshore Occurrence of Common Terns, Endangered Roseate Terns, and Threatened Piping Plovers with VHF Arrays* (Loring et al. 2019)
- *Tracking Movements of Threatened Migratory rufa Red Knots in U.S. Atlantic OCS Waters* (Loring et al. 2018)
- "Assessing the exposure of three diving bird species to offshore wind areas on the U.S. Atlantic Outer Continental Shelf using satellite telemetry" (Stenhouse et al. 2020)
- Atlantic and Great Lakes Sea Duck Migration Study initiated by the Sea Duck Joint Venture (SDJV)
- NYSERDA's (2021b) *Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy: Spatial and Temporal Marine Wildlife Distributions in the New York Offshore Planning Area, Summer 2016–Spring 2019: Volume 1: Methods, General Results, Limitations, and Discussion*
- NYSERDA's (2017a) *New York State Offshore Wind Master Plan: Birds and Bats Study*
- NYSERDA's (2017b) *New York State Offshore Wind Master Plan: Cable Landfall Permitting Study*
- NYSERDA's Multi-Scale Relationships Between Marine Predators and Forage Fish project (ongoing)
- Bat activity during autumn relates to atmospheric conditions: implications for coastal wind energy development (Smith and McWilliams 2016)
- *Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) Construction and Operations Plan*, Appendix R: 2018 Bat Survey Report (Tetra Tech 2022)
- BOEM studies and environmental assessments for other offshore wind projects, such as:
  - BOEM's (2023c) *Empire Offshore Wind Final Environmental Impact Statement, Volume 1*
  - BOEM's (2023d) *Ocean Wind 1 Final Environmental Impact Statement*

5.1.2 Data Collected

Describe data collected, or will be collected, to support baseline characterization.

- BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the Lease Area. This will help to inform the baseline characterization of birds and bats.
- Through scientific literature review, we have performed an initial assessment of the occurrence of birds and bats in the vicinity of the Lease Area, OECC, and onshore facilities, which will be refined as part of the Vineyard Mid-Atlantic COP through a detailed review of available data, integration of BOEM's analysis in the PEIS, and consultations with agencies and stakeholders.

5.2 Species at Risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the bird species that may pass through the vicinity of the Lease Area, the species of greatest concern are the three federally listed species (which are also state-listed): roseate tern, piping plover, and red knot. These species of birds are expected to have minimal to low exposure to the Lease Area.
- The northern long-eared bat is expected to be the bat species of greatest concern because the species was recently reclassified as endangered under the ESA, and the onshore facilities may be

located near roosting or foraging habitat. Vineyard Offshore will work with the New York Natural Heritage Program, as necessary, with respect to potential impacts to the northern long-eared bat from the onshore facilities' proximity to known roost trees or hibernacula.

5.3 Potential Impacts or Risks and Mitigation Measures by Project Stage

The table below should list the potential impacts and mitigation measures to understand and minimize the Project's risk to birds and bats. At a minimum this should include the steps the Developer will pursue to minimize risk to birds and bats (e.g., lighting), and identification of technological approaches to assess impacts or any Proposals for other research or mitigations relating to birds or bats planned or under consideration at this time.

Vineyard Offshore has identified preliminary measures to avoid, minimize, and mitigate potential impacts to birds and bats from the Project. However, it is premature to finalize monitoring and mitigation measures at this stage of the Project's permitting process, which necessarily entails a thorough assessment of potential impacts and subsequent finalization of appropriate and practicable mitigation measures to address impacts. This multi-year iterative and adaptive process accounts for changing technologies, expanding information about marine species, and lessons learned from other offshore wind projects in the Mid-Atlantic and Northeast.

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
Collision risk to marine birds and bats	• The OWF's location far offshore avoids and minimizes exposure of many birds and bats. • The WTGs will be spaced far apart and have significant air gaps, which minimizes collision risk to marine birds, given that many seabirds will fly below the rotor swept zone. • To avoid and minimize attraction- and disorientation-related impacts to birds and bats, the Project's artificial lighting will be reduced to the extent practicable while maintaining human safety and compliance with the Federal Aviation Administration (FAA), the United States Coast Guard, BOEM, and other regulations. • During operations, the Project will use an aircraft detection lighting system (ADLS) or similar system that automatically activates all aviation obstruction lights on the WTGs and electrical service platform when aircraft approach the structures, subject to BOEM approval. The use of an ADLS will dramatically reduce the amount of time that the aviation obstruction lights are illuminated. • Monitoring will be conducted to determine whether there is a need for perching-related deterrents to reduce attraction and minimize potential perching and loafing opportunities for birds. • Physical and/or other deterrents to perching (such as spikes and netting or other best available technology) will		X	X	

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	be implemented if there is demonstrated risk at the site (e.g., perching and roosting on infrastructure is a common occurrence) and to the extent that they do not represent a human safety hazard.				
Habitat impacts, including breeding and nesting areas	• Siting and construction of nearshore and onshore Project components (including nearshore export cable routes, landfall sites, onshore cable routes, and onshore substations) will be conducted in such a way as to avoid or minimize the loss or alteration of bird and bat habitat, as well as avoid or minimize disturbance and direct and indirect effects to bird and bat populations and their prey. Specifically, onshore infrastructure and development activities should (1) maximize the use of previously developed or disturbed areas (e.g., by installing onshore cables within existing roadway layouts) and (2) avoid unique or protected habitats, as well as habitat for key species, where feasible.		X	X	X

**Phase: 1: Survey/Design; 2: Construction; 3: Operations; 4: Decommissioning*
Note:
1. The proposed measures described in this table are preliminary in nature and subject to review and approval from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.

5.4 Monitor for Impacts During Each Phase

Describe how potential impacts will be monitored on birds and bats during each phase of physical work for the Project (site assessment, construction, operations, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

- Vineyard Offshore will implement appropriate monitoring measures to assess potential impacts to birds and bats from the Project.
- Vineyard Offshore will consult with agencies and relevant stakeholders to determine which Project phases will include monitoring and the specific questions that should be addressed. This will take into account efforts already underway or planned for other projects to avoid redundancy and address issues specific to the Project.

5.4.1 Pre- and Post-construction Monitoring to Assess and Quantify Changes

Describe how changes to environmental resources will be quantified using statistically sound methods.

- Pre- and post-construction monitoring will be designed in such a way that it improves understanding of the impacts of offshore wind energy development on birds and bats, including identifying specific questions and taxa on which to focus monitoring efforts for the Project, or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.

- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.
- To the greatest extent practicable, monitoring activities will be designed to work with or operate within regional study efforts to both contribute to regional science and enable the use of larger data sets to assess impacts.

5.4.2 Address Data Gaps

Describe how data gaps will be addressed.

- The occurrence of birds in the New York Bight region and surrounding waters is well-documented.
- In accordance with the lease agreement, to help address information gaps on offshore movements of birds and bats, we will install and maintain Motus stations on meteorological or environmental data buoys in coordination with the United States Fish and Wildlife Service's (USFWS's) Offshore Motus network.
- In addition, broader concerns about data gaps are anticipated to be identified and addressed through regional monitoring organizations, such as RWSC and ROSA. Vineyard Offshore will continue participating in regional monitoring organizations to support efforts to address identified data gaps.
- Vineyard Offshore will work with relevant stakeholders, including regulatory agencies, to identify data gaps to be addressed through surveys or permitting applications.

5.5 Strategies for Developing Alternate Protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore habitat for impacted birds and bats in an alternative location.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know whether offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.
- As necessary, Vineyard Offshore will explore this topic further in consultation with regulatory agencies as well as the E-TWG and relevant stakeholders.

6 Proposed Mitigation of Impacts to Fish, Invertebrates, and Their Habitats

6.1 Baseline Characterization

Describe what is known about the proposed site in terms fish and invertebrate assemblage, and temporal and spatial variations in fish, invertebrates and their habitats at the proposed site. The use of collaborative monitoring models with the fishing community is encouraged to develop trusted baseline data.

6.1.1 Available Information

Describe key existing literature and datasets that are available for baseline characterization.

Numerous data sources characterize the temporal and spatial distribution, abundance, and community composition of fish, invertebrates, and their habitats potentially affected by Project activities. Key data sources by others include, but are not limited to:

- Northeast Fisheries Science Center (NEFSC) multispecies bottom trawl surveys
- NEFSC Atlantic surf clam and ocean quahog surveys
- NEFSC Atlantic sea scallop dredge surveys
- NYSDEC's (2013) New York State Department of Environmental Conservation (NYSDEC) 2006-2012 Atlantic Ocean Surfclam Population Assessment
- NYSDEC's (2023) NYSDEC Nearshore Ocean Trawl Survey
- Northeast Area Monitoring and Assessment Program (NEAMAP) trawl surveys
- Northeast Ocean Data Portal
- NYSERDA's (2021b) *Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy: Spatial and Temporal Marine Wildlife Distributions in the New York Offshore Planning Area, Summer 2016–Spring 2019: Volume 1: Methods, General Results, Limitations, and Discussion*
- NYSERDA's (2017c) *New York State Offshore Wind Master Plan: Fish and Fisheries Study*
- National Oceanic and Atmospheric Administration (NOAA) Fisheries Species Directory: ESA Threatened & Endangered and Deep Sea Coral Data Portal databases
- NOAA Fisheries Socioeconomic Impacts of Atlantic Offshore Wind Development webpage
- *Habitat Mapping and Assessment of Northeast Wind Energy Areas* (Guida et. al 2017)
- BOEM studies and environmental assessments for other offshore wind projects, such as BOEM's (2021b) *Commercial and Research Wind Lease and Grant Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf of the New York Bight, Draft Environmental Assessment*

6.1.2 Data Being Collected

Describe data collected, or will be collected, to support baseline characterization.

- Vineyard Offshore d collected benthic grab and video survey data in the Lease Area and along the

OECC in 2022 and 2023.

- BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the Lease Area. This will help to inform the baseline characterization of fish, invertebrates, and their habitats.
- Using the results of the Vineyard Offshore benthic survey and the wealth of existing data sources for the New York Bight region, we have prepared an assessment of the presence of finfish, invertebrates, and their habitats in the Lease Area and the OECC as part of the Vineyard Mid-Atlantic COP. This information will be confirmed and refined through consultations with agencies and stakeholders.

6.2 Species at Risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the six federally listed fish species that may occur off the northeast Atlantic coast (shortnose sturgeon, Atlantic sturgeon, Atlantic salmon, giant manta ray, oceanic whitetip shark, and scalloped hammerhead), only the Atlantic sturgeon is anticipated to potentially occur within the Lease Area, OECC, and surrounding waters.
- An Essential Fish Habitat is designated for 40 species within the Lease Area and OECC. No Habitat Areas of Particular Concern are located within the Lease Area or OECC.
- Based on NMFS's Landing and Revenue Data (2008–2022), key commercially important fish and invertebrate species within the Lease Area are expected to include Atlantic sea scallop, monkfish, Atlantic mackerel, Atlantic herring, summer flounder, longfin squid, black sea bass, scup, and surfclam.

6.3 Potential Impacts or Risks and Mitigation Measures by Project Stage

The table below should list the potential impacts to fish, invertebrates, and their habitats and proposed mitigation measures. To this end, this section should describe how the Developers will minimize risk to fish, invertebrates, and their habitats (e.g., foundation type, scour protection, cable shielding for electromagnetic fields, construction windows, siltation/turbidity controls, use of dynamic-positioning vessels and jet plow embedment).

Vineyard Offshore has identified preliminary measures to avoid, minimize, and mitigate potential impacts to fish, invertebrates, and their habitats from the Project. However, it is premature to finalize monitoring and mitigation measures at this stage of the Project's permitting process, which necessarily entails a thorough assessment of potential impacts and subsequent finalization of appropriate and practicable mitigation measures to address impacts. This multi-year iterative and adaptive process accounts for changing technologies, expanding information about marine species, and lessons learned from other offshore wind projects in the Mid-Atlantic and Northeast.

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
Micrositing conflicts with habitats and fishery resources	• BOEM sited the Lease Area through a public, multi-year process to avoid and minimize potential impacts to fish, invertebrates, and fisheries from offshore wind development. • Vineyard Offshore will seek input from regulatory authorities, the fishing industry, and the maritime industry to locate foundations and cable routes in the least impactful manner that is practicable. • The WTGs are widely spaced so that their foundations (and associated scour protection), along with cable protection for inter-array cables (if needed), only occupy a minimal portion of the Lease Area, leaving the vast majority of the site undisturbed. • To the greatest extent feasible, Vineyard Offshore will site the offshore cables to avoid and minimize impacts to sensitive habitats. • Vineyard Offshore will conduct G&G and environmental surveys to inform the Project's design and layout.	X			
Temporary alteration of the seabed and localized increases in noise and turbidity	• Vineyard Offshore will use noise attenuation technologies to reduce sound from pile driving of foundations (if such methods are used). • Pile driving noise will be mitigated through a soft start, which allows fish time to move away from the area. • Other mitigation measures implemented to protect marine mammals and sea turtles from underwater noise will also protect fish species (see Section 4.3). • Scour protection may be installed around foundations, where necessary, to minimize scouring and sediment suspension around foundations. • The use of mid-line anchor buoys will be considered, where feasible and safe, as a potential measure to reduce impacts from anchor line sweep.		X		
Long-term changes to seabed habitat	• Vineyard Offshore will, to the extent possible, avoid sensitive benthic habitats. • Vineyard Offshore will seek collaboration with state and federal regulatory authorities and key stakeholders to assess the use of ecological enhancements to provide offsets from potential adverse impacts. • Vineyard Offshore's goal is to minimize the use of cable	X	X	X	X

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	protection to the greatest extent possible through a careful routing assessment and the selection of the most appropriate cable burial tool(s) to achieve a sufficient burial depth, taking into account site-specific environmental conditions and cable properties. • The addition of foundations, scour protection, and cable protection (if required) may act as an artificial reef and provide habitat previously absent from the area.				
EMF impacts	• Vineyard Offshore will use proper shielding to reduce EMFs. This can be achieved through sheathing and burial of cables; where sufficient burial depth cannot be achieved, the cables will be covered by cable protection (which would shield EMFs). • Vineyard Offshore will conduct EMF modeling and assessments that could be used to identify potential mitigation requirements as part of the permitting process.		X	X	
Cable burial	• Vineyard Offshore will bury export and inter-array cables to an appropriate minimal depth to reduce exposure risk. If sufficient depth cannot be reached, Vineyard Offshore will add protective materials over the cable. • Cable burial techniques will be selected to maximize the likelihood of achieving sufficient cable burial, minimize the need for cable protection, and minimize suspended sediments during installation. • Vineyard Offshore will conduct routine surveys or inspections of subsea cables and will conduct a survey or inspection to ensure and correct for cable exposure following a hurricane or other major events causing disturbance to the seabed.		X	X	

**Phase: 1: Survey/Design; 2: Construction; 3: Operations; 4: Decommissioning*
Note:
1. The proposed measures described in this table are preliminary in nature and subject to review and approval from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.

6.4 Monitor for Potential Impacts During Each Phase

Describe how potential impacts will be monitored on these types of fish and invertebrates during each phase of physical work for the Project (site assessment, construction, operation, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

- Vineyard Offshore will likely develop a benthic habitat monitoring plan to monitor key indicators before and after construction. The need for a benthic habitat monitoring plan would be identified through the permitting process and in consultation with regulatory agencies and relevant

stakeholders. Such a monitoring plan, if developed, may also be part of regional monitoring efforts.

- Vineyard Offshore will develop a fisheries monitoring plan to monitor key indicators before and after construction. The fisheries monitoring plan will be developed through the permitting process and in consultation with regulatory agencies and relevant stakeholders. Such a monitoring plan may also be part of regional monitoring efforts.
- Vineyard Offshore will seek to collaborate with other regulatory agencies and stakeholder groups (e.g., the E-TWG, the F-TWG, and ROSA) to identify research needs and opportunities.
- When developing monitoring plans, Vineyard Offshore would consider *Offshore Wind Project Monitoring Framework and Guidelines* (ROSA 2021) and would rely heavily on our experience and data obtained from developing and implementing monitoring plans for Vineyard Wind 1.

6.4.1 Pre- and Post-construction Monitoring to Assess and Quantify Changes

Describe how changes to environmental resources will be quantified using statistically sound methods.

- Vineyard Offshore will continue to gain valuable experience assessing changes attributable to Project activities through the monitoring plans that are being implemented for Vineyard Wind 1. For example, scientifically sound, statistically rigorous methods employed for Vineyard Wind 1 include a beyond Before-After-Control-Impact (BACI) framework to assess potential impacts to fish and a combination BACI-Before-After-Gradient (BAG) sampling design to assess potential impacts to benthic resources.
- Ideally, specific questions and focal taxa will be chosen for the Project, either based on site-specific fisheries risk assessment or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.
- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.
- Vineyard Offshore will continue to collaborate with other regulatory agencies and stakeholder groups to identify research needs and opportunities.

6.4.2 Addressing Data Gaps

Describe how data gaps will be addressed.

- Many recently completed studies, as well as data from long-term monitoring programs, provide information about fish, invertebrates, and benthic habitats (especially sensitive habitats) within the Lease Area, OECC, and surrounding waters.
- To help address data gaps regarding recreational fishing in the Massachusetts Wind Energy Area (MA WEA) and Rhode Island/Massachusetts Wind Energy Area (RI/MA WEA), we previously partnered with the New England Aquarium's Anderson Cabot Center for Ocean Life to study highly migratory species presence and are supporting INSPIRE Environmental and the New England Aquarium's study of highly migratory species in the region. We would consider supporting similar efforts for the Lease Area.

- Vineyard Offshore will continue to work with fishermen, fisheries stakeholders, and agencies to identify data gaps that may be addressed through surveys or permitting applications.

6.5 Strategies for Developing Alternate Protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore habitat for impacted fisheries in an alternative location or when the provision of compensation of some form may be appropriate.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know whether offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.
- As necessary, Vineyard Offshore will explore this topic further in consultation with regulatory agencies, as well as the E-TWG and relevant stakeholders.

7 Considerations for Subsea and Overland Cables

7.1 Mitigation Strategies for Subsea and Overland Cables

This section should describe any additional environmental mitigation strategies for proposed subsea and overland cable routes that support the offshore wind project.

- Vineyard Offshore has and will continue to design the OECC in consultation with agencies and relevant stakeholders to avoid or minimize the length of cable through sensitive habitats (e.g., mapped hard and complex bottom, critical habitat for ESA-listed species, artificial reefs, submerged aquatic vegetation), to the extent feasible.
- To further minimize impacts, Vineyard Offshore will microsite individual offshore export cable alignments within the OECC to avoid sensitive habitats (where feasible) using the geophysical survey data that we collect, but avoidance of all sensitive habitats is not always possible.
- Vineyard Offshore will require our cable installation contractors to prioritize the least environmentally impactful cable installation methods(s) and tool(s) that are practicable for each segment of cable.
- Vineyard Offshore's goal is to minimize the use of cable protection to the greatest extent possible through a careful routing assessment and the selection of the most appropriate cable burial tool(s) to achieve a sufficient burial depth, taking into account site-specific environmental conditions and cable properties.
- Vineyard Offshore will endeavor to consolidate the Project's cables with existing infrastructure,

where possible.

- The proposed landfall site was selected to minimize offshore and onshore cable length, which correspondingly minimizes potential impacts to sensitive habitats nearshore and onshore.
- Trenchless crossing methods are expected to be used (1) in nearshore areas where sensitive resources are located near the potential landfall site to minimize disturbance of coastal habitats by drilling underneath them instead of through them and (2) where onshore export cables routes traverse wetlands and waterbodies to avoid impacts to those features.
- The underground onshore export cable routes are sited almost entirely within public roadway layouts to minimize disturbance to terrestrial wildlife and habitat, as well as cultural resources.

8 Additional Considerations

8.1 Additional Mitigation Strategies and Environmental Mitigation Plan Refinement

This section should describe any additional mitigation strategies not otherwise described herein that would improve the Plan and reduce impacts on wildlife. In addition, describe how the EMP will be updated and refined based on additional information and stakeholder feedback.

- Vineyard Offshore is committed to ensuring that we employ measures that afford the highest levels of environmental protection while maintaining Project viability. Throughout the Project's multi-year permitting process, we will continue to assess potential risks to species and identify and implement measures to avoid, minimize, or mitigate potential impacts to wildlife in line with applicable permitting requirements, as well as regional monitoring efforts. Stakeholder input, as well as lessons learned from Vineyard Wind 1 and other offshore wind projects, will inform this effort.
- Vineyard Offshore will support collaborative research on potential mitigation strategies and best management practices in coordination with other developers, agencies, and stakeholders.

8.2 Process for Updating the Environmental Mitigation Plan

This section should describe how feedback from environmental stakeholders, the E-TWG, and other agencies and working groups will be incorporated and updated in the EMP.

- Vineyard Offshore will continuously evaluate and evolve this EMP in line with applicable federal and state permitting requirements.
- Vineyard Offshore expects that additional guidance and information will become available throughout the planning and regulatory process and, as such, will continue to consider its relevance to the EMP at the appropriate intervals.
- Updates to the EMP are intended to reflect the results of iterative exchanges with members of the E-TWG, the F-TWG, working groups, agencies, and relevant stakeholders.

- Vineyard Offshore will update the EMP in a timely manner that reflects changes made based on key regulatory Project deliverable dates.

9 Project Decommissioning

9.1 Potential Impacts on Marine Wildlife, Birds, Bats, and Fisheries

This section should describe potential impacts to marine mammals, sea turtles, birds, bats, and fisheries and habitats from decommissioning the project, based on available information and relevant experience (if any).

- Vineyard Offshore's waste handling processes during decommissioning will focus on re-use or recycling, with disposal as the last option.
- Vineyard Offshore will collaborate with regulatory authorities and key environmental stakeholder groups to better understand the effects and potential impacts associated with decommissioning.

9.2 Approach for Decommissioning Plan and Coordination with Stakeholders

This section should describe how a decommissioning plan will be developed to identify and mitigate potential impacts, including coordination with stakeholders, and any elements of its contemplated decommissioning plan that can be identified at this stage.

- Vineyard Offshore will decommission the Project in accordance with all necessary laws and regulations and generate a detailed Project-specific Decommissioning Plan.
- Vineyard Offshore will seek input on the detailed Project-specific Decommissioning Application from regulatory agencies, fisheries and marine stakeholders, and local communities.
- Vineyard Offshore will use lessons learned from the construction and operations activities, as well as other offshore wind projects and apply them (when appropriate) to the Decommissioning Plan.

Section 8.2 Attachments

Response to New York State Energy Research and Development Authority Request for Proposals ORECRFP24-1

VINEYARD OFFSHORE

PUBLIC

VINEYARD OFFSHORE

Attachment 8.2-1: EMP References

ATTACHMENT 8.2-1
EMP REFERENCES

Bellmann MA, Brinkmann J, May J, Wendt T, Gerlach S, Remmers P. 2020. Underwater noise during the impulse pile-driving procedure: Influencing factors on pile-driving noise and technical possibilities to comply with noise mitigation values. Supported by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit [BMU]), FKZ UM16 881500. Commissioned and managed by the Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie [BSH]). Page 137 in N. C. a. N. S. Federal Ministry for the Environment, editor.

[BOEM] Bureau of Ocean Energy Management. 2013. Commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York, and New Jersey wind energy areas. NER-2012-9211. Endangered Species Act Section 7 consultation biological opinion. Page 255.

[BOEM] Bureau of Ocean Energy Management. 2014. Commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf offshore Massachusetts. OCS EIS/EA BOEM 2014-603. [June 2014]. https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/MA/Revised-MA-EA-2014.pdf.

[BOEM] Bureau of Ocean Energy Management. 2019a. Guidelines for providing benthic habitat survey information for renewable energy development on the Atlantic Outer Continental Shelf pursuant to 30 CFR part 585. US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [June 2019] http://www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Renewable-Benthic-Habitat-Guidelines.pdf.

[BOEM] Bureau of Ocean Energy Management. 2019b. Guidelines for providing information on marine mammals and sea turtles for renewable energy development on the Atlantic Outer Continental Shelf pursuant to 30 CFR part 585. US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [June 2019].https:/www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Marine-Mammals-and-Sea-Turtles-Guidelines.pdf.

[BOEM] Bureau of Ocean Energy Management. 2020a. Information guidelines for a renewable energy construction and operations plan (COP). Version 4.0. US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [May 27, 2020]. https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines_Technical_Corrections.pdf.

[BOEM] Bureau of Ocean Energy Management. 2020b. Guidelines for providing avian survey information for renewable energy development on the Outer Continental Shelf pursuant to 30 CFR part 585. US Department of the Interior, Bureau of Ocean Energy

Management, Office of Renewable Energy Programs. [May 27, 2020]. https://www.boem.gov/sites/default/files/documents/newsroom/Avian%20Survey%20Guidelines.pdf.

[BOEM] Bureau of Ocean Energy Management. 2021a. Project design criteria and best management practices for protected species associated with offshore wind data collection. Revised November 2021. https://www.boem.gov/sites/default/files/documents//200BPDCs%20and%20BMPs%20for%20Atlantic%20Data%20Collection%2011222021.pdf

[BOEM] Bureau of Ocean Energy Management. 2021b. Commercial and research wind lease and grant issuance and site assessment activities on the Atlantic Outer Continental Shelf of the New York Bight, draft environmental assessment. OCS EIS/EA BOEM 2021-041. [August 2021]. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/NY-Bight-Draft-EA-2021.pdf.

[BOEM] Bureau of Ocean Energy Management. 2023a. Final information needed for issuance of a notice of intent (NOI) under the National Environmental Policy Act (NEPA) for a construction and operations plan (COP). US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [August 2023]. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM%20NOI%20Checklist.pdf.

[BOEM] Bureau of Ocean Energy Management. 2023b. Guidelines for providing information on fisheries for renewable energy development on the Atlantic Outer Continental Shelf pursuant to 30 CFR Part 585. US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. [March 27, 2023] https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf.

[BOEM] Bureau of Ocean Energy Management. 2023c. Empire Offshore Wind final environmental impact statement, volume 1. OCS EIS/EA BOEM 2023-049. [accessed January 2, 2024]. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Empire_Wind_FEIS_Vol1_0.pdf.

[BOEM] Bureau of Ocean Energy Management. 2023d. Ocean Wind 1 final environmental impact statement. OCS EIS/EA BOEM 2023-020. [accessed January 2, 2024]. https://www.boem.gov/renewable-energy/state-activities/oceanwind1feis.

[BOEM] Bureau of Ocean Energy Management. 2024. New York Bight draft programmatic environmental impact statement. OCS EIS BOEM 2024-001. Docket Number: BOEM-2024-0001.

Buehler D, Oestman R, Reyff J, Pommerenck K, Mitchell B. 2015. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Contract No. 43A0306, Sacramento, CA.

Dowling Z, Sievert PR, Baldwin E, Johnson L, von Oettingen S, Reichard J. 2017. Flight activity and offshore movements of nano-tagged bats on Martha's Vineyard, MA. OCS Study BOEM 2017-054. US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Sterling, Virginia. [June 2017]. https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Renewable-Energy/Flight-Activity-and-Offshore-Movements-of-Nano-Tagged-Bats-on-Martha%27s-Vineyard%2C-MA.pdf.

Estabrook BJ, Hodge B, Salisbury DP, Rahaman A, Ponirakis D, Harris DV, Zeh SE, Parks S, Rice AN. 2021. Final report for New York Bight whale monitoring passive acoustic surveys October 2017 - October 2020.

Furness RW, Wade HM, Masden EA. 2013. Assessing vulnerability of marine bird populations to offshore wind farms. Journal of Environmental Management. 119:56–66.

Guida V, Drohan A, Welch H, McHenry J, Johnson D, Kentner V, Brink J, Timmons D, Pessutti J, Fromm S, Estela-Gomez E, NOAA, NMFS, Northeast Fisheries Science Center, J.J. Howard Laboratory. 2017. Habitat mapping and assessment of northeast wind energy areas. Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. Report No.: OCS Study BOEM 2017-088. [December 2017]. https://espis.boem.gov/final%20reports/5647.pdf.

Hayes SA, Josephson E, Maze-Foley K, Rosel PE, Wallace E. 2022. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2021. Woods Hole (MA): US Department of Commerce, National Fisheries Science Center. [May 2022]. https://media.fisheries.noaa.gov/2022-08/U.S.%20Atlantic%20and%20Gulf%20of%20Mexico%202021%20Stock%20Assessment%20Report.pdf.

Hayes SA, Josephson E, Maze-Foley K, Rosel P, McCordic J, Wallace J. 2023. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2022. US Department of Commerce, National Oceanic and Atmospheric Administration. [June 2023]. https://media.fisheries.noaa.gov/2023-08/Final-Atlantic-and-Gulf-of-Mexico-SAR.pdf.

Loring PH, McLaren JD, Smith PA, Niles LJ, Koch SL, Goyert HF, Bai H. 2018. Tracking movements of threatened migratory *rufa* Red Knots in U.S. Atlantic Outer Continental Shelf Waters. Sterling (VA): US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-046. https://espis.boem.gov/Final Reports/BOEM_2018-046.pdf.

Loring PH, Paton PWC, McLaren JD, Bai H, Janaswamy R, Goyert HF, Griffin CR, Sievert PR. 2019. Tracking offshore occurrence of common terns, endangered roseate terns, and threatened piping plovers with VHF arrays. Sterling (VA): US Department of the Interior,

Bureau of Ocean Energy Management. OCS Study BOEM 2019-017. https://espis.boem.gov/final reports/BOEM_2019-017.pdf.

[NMFS] National Marine Fisheries Service. 2018. 2018 revision to technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (version 2.0). Underwater thresholds for onset of permanent and temporary threshold shifts. Silver Spring, MD. https://www.fisheries.noaa.gov/action/2018-revision-technical-guidance-assessing-effects-anthropogenic-sound-marine-mammal-hearing

[NYSDEC] New York State Department of Environmental Conservation Division of Fish, Wildlife and Marine Resources. 2013. 2006-2012 Atlantic Ocean surfclam population assessment. https://dec.ny.gov/nature/waterbodies/oceans-estuaries/ocean-action-plan/ocean-ecosystem-based-fisheries.

[NYSDEC] New York State Department of Environmental Conservation. 2015. List of endangered, threatened and special concern fish & wildlife species of New York State. https://dec.ny.gov/nature/animals-fish-plants/biodiversity-species-conservation/endangered-species/list.

[NYSDEC] New York State Department of Environmental Conservation. 2019. Current and proposed status of all species on proposed list. https://www.dec.ny.gov/docs/wildlife_pdf/masterlistpropreg.pdf.

[NYSDEC] New York State Department of Environmental Conservation. 2023. Ocean monitoring projects- nearshore ocean trawl survey (2018- 2023) processed by NYSDEC provided to Epsilon Associates [September 2023].

[NYSERDA] New York State Energy and Research and Development Authority. 2017a. New York State offshore wind master plan: birds and bats study. [November 2017]. https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25d-OSW-Birds-and-Bats.pdf.

[NYSERDA] New York State Energy and Research and Development Authority. 2017b. New York State offshore wind master plan: cable landfall permitting study. [November 2017]. https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25e-OSW-Cable-Landfall-Permitting-Study.pdf.

[NYSERDA] New York State Energy and Research and Development Authority. 2017c. New York State offshore wind master plan: fish and fisheries study. [November 2017] https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/About-Offshore-Wind/Master-Plan.

[NYSERDA] New York State Energy and Research and Development Authority. 2017d. New York State offshore wind master plan: marine mammals and sea turtles study. [November 2017]. https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/

Publications/Research/Biomass-Solar-Wind/Master-Plan/17-25L-Marine-Mammals-and-Sea-Turtles-Study.pdf.

[NYSERDA] New York State Energy and Research Development Authority. 2021a. Wildlife data standardization and sharing: environmental data transparency for New York State offshore wind energy. NYSERDA Report 21-11. Prepared by E Jenkins and K Williams, Biodiversity Research Institute, Portland ME. [May 2021] https://www.nyserda.ny.gov/-/media/Project/Nyserda/files/Programs/offshore-wind/21-11-Wildlife-Data-Standardization-and-Sharing-Environmental-Data-Transparency-for-NYS-OSW-Energy.pdf.

[NYSERDA] New York State Energy Research and Development Authority. 2021b. Digital aerial baseline survey of marine wildlife in support of offshore wind energy: spatial and temporal marine wildlife distributions in the New York Offshore Planning Area, summer 2016–spring 2019, volume 1: methods, general results, limitations, and discussion. NYSERDA Report Number 21-07a. Prepared by Normandeau Associates, Inc., Gainesville, FL, and APEM, Ltd., Stockport, UK. [October 2021]. https://remote.normandeau.com/docs/21-07a_Digital_Aerial_Baseline_Survey_of_Marine_Wildlife_in_Support_of_Offshore_Wind_Energy.pdf.

Peterson TS, Pelletier SK, Boyden SA, Watrous KS. 2014. Offshore acoustic monitoring of bats in the Gulf of Maine. Northeastern Naturalist. 21:154–163.

Roberts JJ. 2022. Habitat-based marine mammal density models for the U.S. Atlantic: latest versions. Marine Geospatial Ecology Laboratory/Duke University.

Roberts JJ, Best BD, Mannocci L, Fujioka E, Halpin PN, Palka DL, Garrison LP, Mullin KD, Cole TVN, Khan CB, McLellan WA, Pabst DA, Lockhart GG. 2016. Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. Scientific Reports 6:22615.

Roberts JJ, Yack TM, and Halpin PN. 2023. Marine mammal density models for the U.S. Navy Atlantic Fleet Training and Testing (AFTT) study area for the Phase IV Navy Marine Species Density Database (NMSDD). Version 1.3. Report by the Duke University Marine Geospatial Ecology Lab for Naval Facilities Engineering Systems Command, Atlantic, Durham, NC. https://seamap.env.duke.edu/seamap-models-files/Duke/Reports/AFTT_Marine_Mammal_Density_Models_2022_v1.3.pdf.

Roberts JJ, Yack TM, Fujioka E, Halpin PN, Baumgartner MF, Boisseau O, Chavez-Rosales S, Cole TVN, Cotter MP, et al. 2024. North Atlantic right whale density surface model for the US Atlantic evaluated with passive acoustic monitoring. Marine Ecology Progress Series 732:167–192.

[ROSA] Responsible Offshore Science Alliance. 2021. Offshore wind project monitoring framework and guidelines. [accessed September 13, 2023]. https://www.nyftwg.com/wp-content/uploads/2021/06/ROSA-Interim-Monitoring-Guidance-Document.pdf.

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

Stenhouse IJ, Berlin AM, Gilbert AT, Goodale MW, Gray CE, Montevecchi WA, Savoy L, and Spiegel CS. 2020. Assessing the exposure of three diving bird species to offshore wind areas on the U.S. Atlantic Outer Continental Shelf using satellite telemetry. Biodiversity Research. 26(12):1703-1714.

Tetra Tech Inc. 2022. Empire Offshore Wind: Empire Wind project (EW 1 and EW 2) construction and operations plan, appendix R: 2018 bat survey report. [May 2022]. https://www.boem.gov/sites/default/files/documents/renewable-energy/Public_EOW%20COP%20Appendix%20R_Offshore%20Bat%20Survey%20Report.pdf.

[USFWS] US Fish and Wildlife Service. 2022a. Endangered and threatened wildlife and plants: endangered species status for northern long-eared bat. 50 CFR Part 17, Docket No. FWS-R3-ES-2021-0140; FF09E21000 FXES1111090FEDR 223.

[USFWS] US Fish and Wildlife Service. 2022b. Endangered and threatened species: status for tricolored bat. Docket FWS-R5-ES-2021-0163.

Whitken, J, and Shurling, C. 2023. Offshore Wind Cable Corridor Constraints Assessment Final Report. NYSERDA Report Number 23-06. [January 2023]. https://nymtwg.com/new-york-offshore-wind-cable-corridor-constraints-assessment-final-report/.

Attachment 8.2-2: [redacted]

Redacted