



Construction and Operations Plan

Lease Area OCS-A 0534

Volume II-D Text

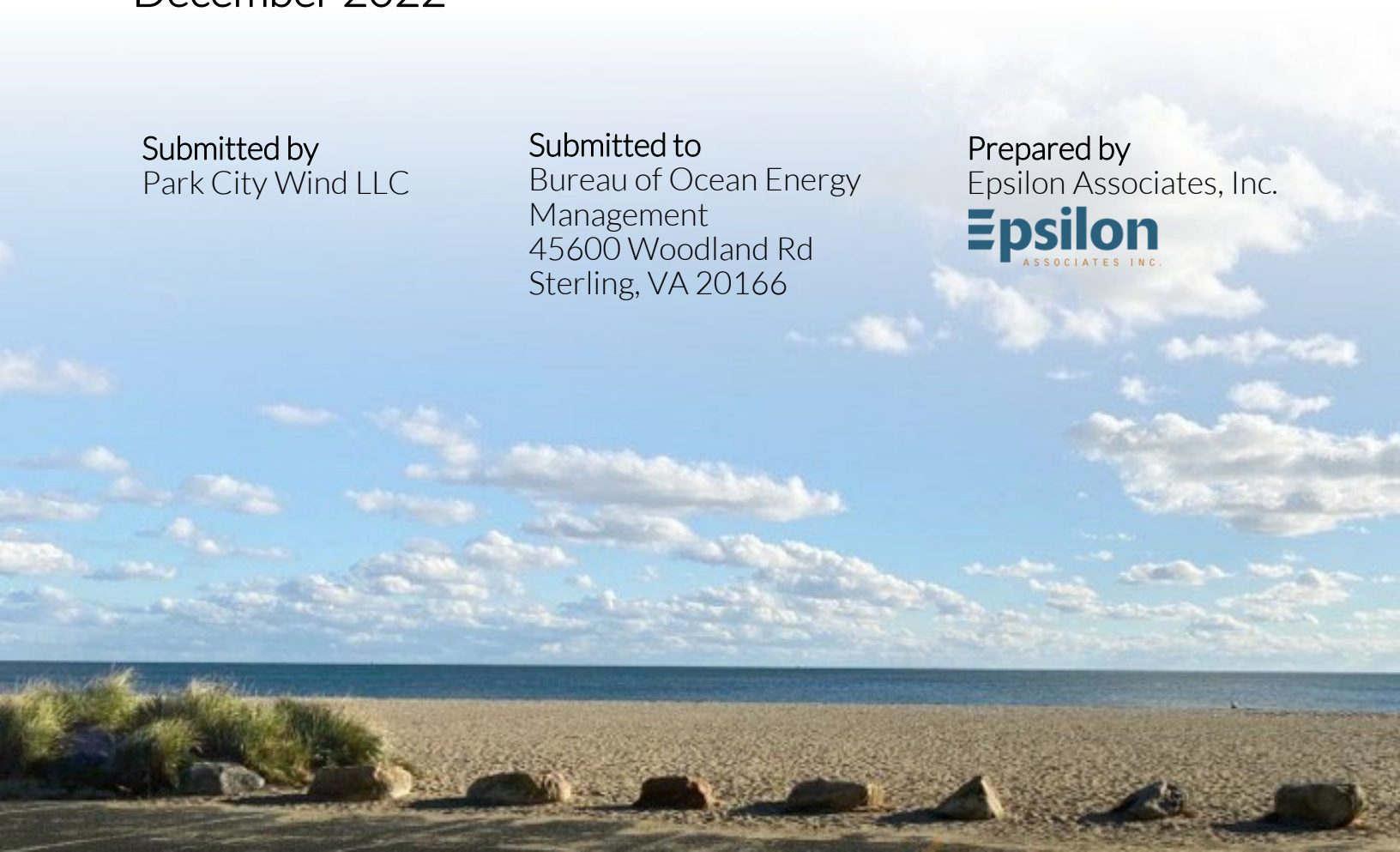
December 2022

Submitted by
Park City Wind LLC

Submitted to
Bureau of Ocean Energy
Management
45600 Woodland Rd
Sterling, VA 20166

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New England Wind Construction and Operations Plan for Lease Area OCS-A 0534

Summary of Marine Archaeological Resources Assessment

Submitted to:

BUREAU OF OCEAN ENERGY MANAGEMENT
45600 Woodland Rd
Sterling, VA 20166

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1.0 INTRODUCTION

Park City Wind, LLC (the Proponent) is proposing to develop offshore renewable wind energy facilities in Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0534. This development is known as New England Wind and includes two phases: Phase 1 (which includes Park City Wind) and Phase 2 (which includes Commonwealth Wind). On behalf of the Proponent, SEARCH, Inc. (SEARCH) and Gray & Pape, Inc. (G&P) completed marine archaeological resources assessments (MARAs) of geophysical and geotechnical survey data collected for the New England Wind Southern Wind Development Area (SWDA; Figure 1) and offshore export cable corridor (OECC) areas in federal waters and Nantucket Sound (Figure 2). The MARAs are presented in Volume II-D of the Construction and Operations Plan (COP) and Appendix E of the COP Addendum for the South Coast Variant submitted to BOEM for New England Wind. The purpose of the assessments was to identify submerged cultural resources or potential submerged cultural resources, that may be affected by seabed-disturbing Project activities, including site characterization surveys and the construction, operation, and/or decommissioning of project facilities.

New England Wind will be developed in two phases within the SWDA. The SWDA consists of Lease Area OCS-A-0534 and a southwest portion of Lease Area OCS-A 0501. While the Proponent intends to install all Phase 2 offshore export cables within the OECC, the Proponent has identified two variations of the OECC that may be employed for Phase 2: the Western Muskeget Variant (WMV), which passes along the western side of Muskeget Channel; and the South Coast Variant (SCV), which connects to a potential second grid interconnection point (Figures 2 and 3). These variations are necessary to provide the Proponent with commercial flexibility should technical, logistical, grid interconnection, or other unforeseen issues arise during the COP review and engineering processes.

The U.S. Department of the Interior (DOI) is charged with managing the OCS under the Outer Continental Shelf Lands Act (43 U.S.C. 1337). DOI delegated certain responsibilities for regulation of renewable energy projects on the OCS to the Bureau of Ocean and Energy Management (BOEM), in the Energy Policy Act of 2005 (Pub. L. 109-58). Federal statutes and regulations require BOEM to identify historic properties and other significant cultural resources that may be affected by renewable energy projects on the OCS and to consider project effects to these properties prior to project approval. These requirements are established in the National Historic Preservation Act of 1966, as amended (NHPA; Title 54 U.S.C.), and the applicable procedures are outlined in the NHPA's implementing regulations (36 CFR § 800). The National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) and NEPA's implementing regulations (40 CFR § 1500-1508) are also applicable.

BOEM has adopted regulations for the planning and development of renewable energy projects on the OCS in 30 CFR § 585. These regulations establish developers' responsibilities for the collection of information to support and facilitate the agency's compliance with the NHPA and NEPA. BOEM's Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR § 585 (May 2020) provides developers and their teams with information on how to comply with 30 CFR § 585. Additionally, stipulations in the OCS-A 0534 lease agreement informed the work conducted by SEARCH and G&P.

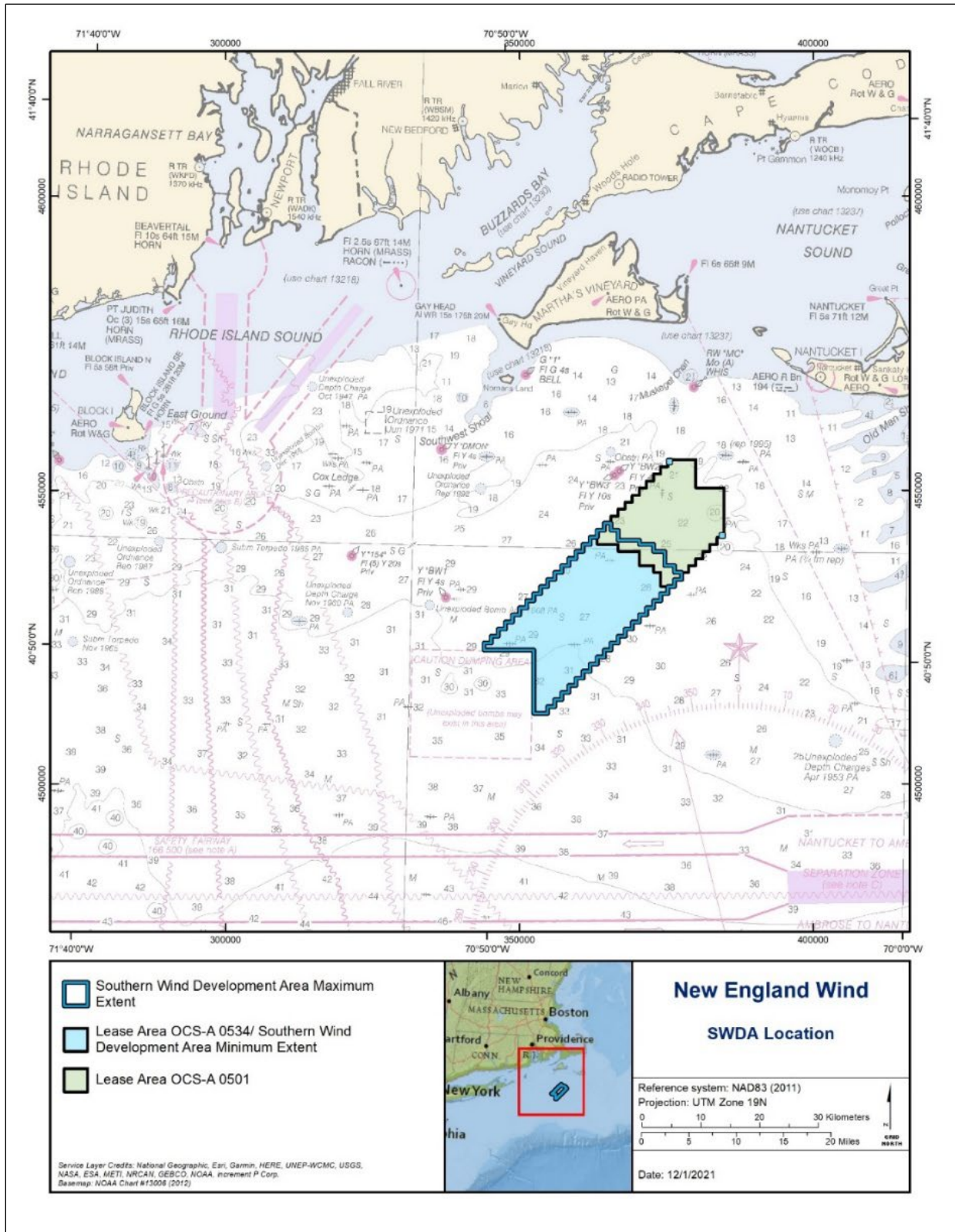


Figure 1 Vicinity Map of the SWDA

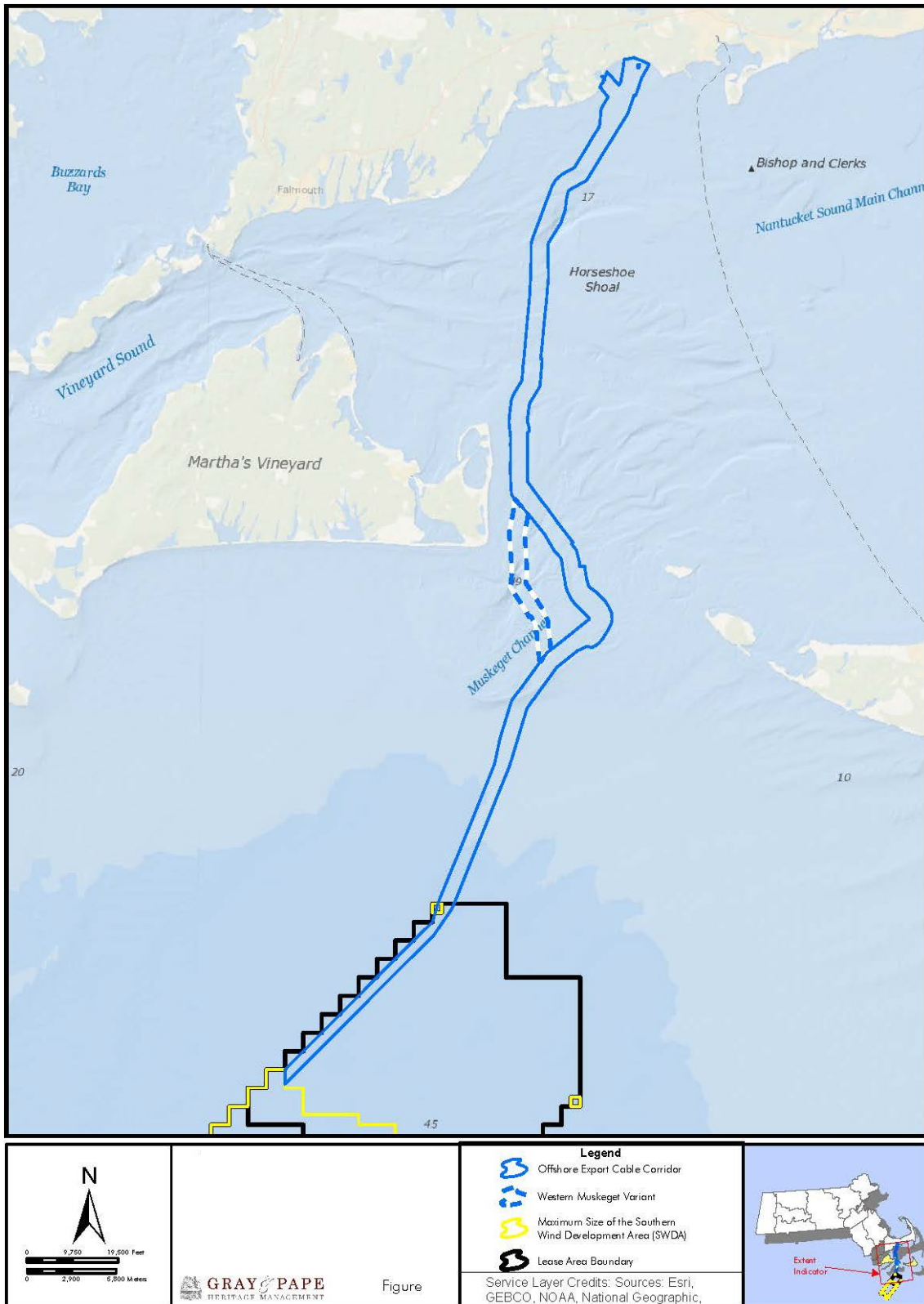


Figure 2 Vicinity Map of the OECC and Western Muskeget Variant (WMV).

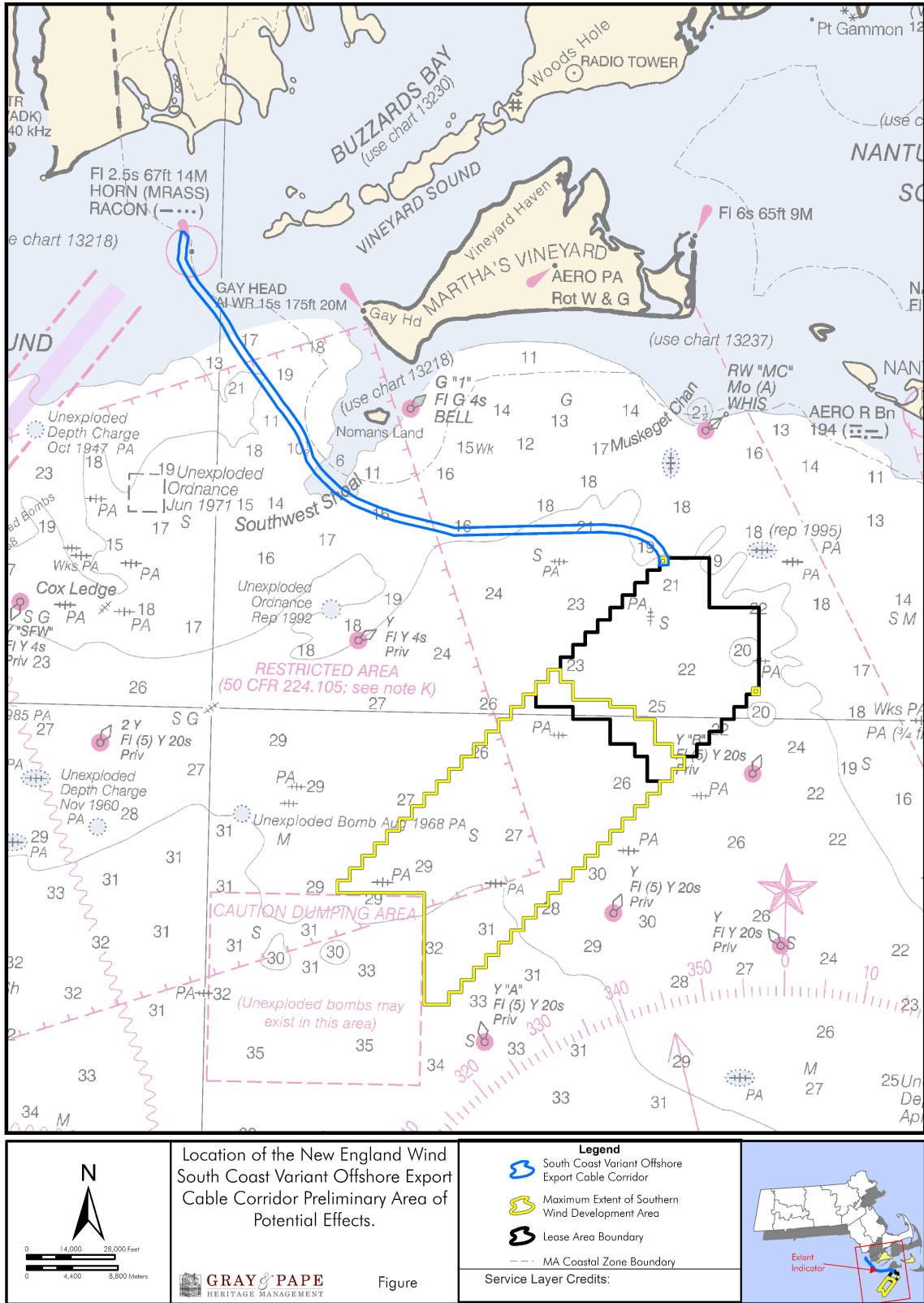


Figure 3 Vicinity Map of the South Coast Variant (SCV).

The SWDA is located in federal waters on the Outer Continental Shelf (OCS), within BOEM Renewable Energy Lease Areas OCS-A 0534 and OCS-A 0501. The SWDA is located approximately 32 kilometers (km) (20 miles [mi]) from the southwest corner of Martha's Vineyard and approximately 38 km (24 mi) from Nantucket. The maximum size of the SWDA measures approximately 34.8 km (21.6 mi) long at its longest point by 16.3 km (53.5 mi) wide and encompasses approximately 111,939 ac (45,300 ha) with water depths ranging from approximately 43 to 62 m (141 to 203 ft). The proposed area of potential effects (PAPE) for the SWDA coincides with the extent of High Resolution Geophysical (HRG) data collected within the maximum potential size of the SWDA and equates to approximately 101,590 ac (41,112 ha). To allow for flexibility in siting, SEARCH assessed the entire area contained within the PAPE. Within the SWDA, the project's PAPE is defined as the depth and breadth of the seabed potentially affected by any proposed bottom-disturbing activities. The proposed development consists of up to 130 wind turbine generators (WTGs, turbines), up to five electrical service platforms (ESPs), inter-link cables, Inter-Array Cables (IACs), submarine offshore export cables, and onshore facilities.

The OECC consists of up to five alternating current (AC) electric cables (220–275 kV and/or 220–345 each) that will connect the SWDA to the existing mainland electric grid in Barnstable, Massachusetts. The submarine export cables will be located within a single corridor averaging approximately 1,100 m (3,609 ft) in width and approximately 78 km (42 nm) in length, encompassing approximately 8,356 ha (20,648 ac). Water depths range from less than 1 m near the proposed landfall to 49.5 m (3.3 to 162 ft) within the OECC which extends north/northeast through federal waters from the SWDA, running east of Martha's Vineyard prior to crossing Nantucket Sound and making landfall in Barnstable, Massachusetts. Infrastructure utilized within the OECC will be limited to transmission cables. The project PAPE along the OECC is defined as the depth and breadth of the seabed potentially affected by any proposed bottom-disturbing activities. The WMV is an alternative for up to 1 to 2 of the proposed export cables and is approximately 10.7 km (5.8 nm) in length, and averages approximately 1,000 m (3,280 ft) in width, encompassing approximately 1,058 ha (2,614 ac). Water depths range from approximately 10 to 32 m (33 to 105 ft) over the WMV, with the deepest depths observed within the existing channel. The SCV originates along the OECC at the northern boundary of the OCS-A 0501 lease area and extends south and west of Martha's Vineyard to the state/federal boundary located west of Cuttyhunk Island and south of Horseneck Beach in Westport Massachusetts. The SCV is approximately 64 km (34.6 nm) in length, and is approximately 845 m (2,772 ft) in width, encompassing approximately 4,806 ha (11,876 ac). Water depths range from approximately 12 to 40 m (39 to 131 ft) over the SCV.

The MARAs for the SWDA, OECC, WMV, and SCV were prepared to satisfy the federal regulatory requirements as outlined in the Bureau of Ocean Energy Management (BOEM) Offshore Renewable Energy Program's Guidelines on Providing Archaeological and Historic Property Information (30 CFR 585). Consistent with BOEM guidelines, the Proponent will seek to avoid cultural resources and potential cultural resources during project development, construction, operation, and decommissioning, where feasible. To accommodate alternate locations for turbine placement or cable routing required to avoid affecting potentially significant cultural resources, survey efforts included an area larger than the designed footprint of the development.

2.0 ARCHAEOLOGICAL ASSESSMENT

SEARCH and G&P provided technical expertise to New England Wind as Qualified Marine Archaeologists (QMAs) pursuant to 30 CFR 585, which established BOEM procedures for the issuance and administration of offshore renewable energy leases. As required by the OCS-A 0534 lease agreement, the Proponent's QMAs participated in pre-survey meetings with BOEM and tribal representatives to obtain feedback during the development and finalization of the marine archaeology survey plan.

The archaeological assessment for potential submerged resources included archival (background) research, geophysical (remote sensing) survey, geotechnical investigations, and laboratory analyses of sediment samples collected from the proposed SWDA, OECC, WMV, and SCV. Archaeological investigations and laboratory analyses were conducted in coordination with federally recognized Native American tribes. The methods and results of the integrated research are summarized below.

2.1 Archival Research

Background research included a review of historical documents, previous research reports, state site files, shipwreck inventories, and historical maps. SEARCH and G&P coordinated with the Massachusetts Historical Commission (MHC) to obtain materials concerning previous marine archaeological surveys and previously identified archaeological sites and shipwrecks within or near the PAPE. Relevant geological and paleoenvironmental sources were reviewed to assist in the effort to establish a baseline for the paleoenvironmental reconstruction of conditions during periods of potential pre-contact land use within the project area. These studies found that during the Last Glacial Maximum (LGM) much of the region was under the glacial sheet with coast lines hundreds of miles farther offshore than modern day. Portions of the SWDA now underwater would have been habitable dry land. Terrestrial landscapes existed in portions of the proposed project area between approximately 24,000 and 11,000 calendar years before present (cal BP) and may have been occupied by Native American people. As the glaciers retreated, additional portions of the project area became available for occupation until being submerged by rising sea levels. Portions of the OECC, WMV, and SCV could have been subaerially exposed until around 3,000 cal BP as sea levels reached near modern levels and the entirety of the proposed OECC, WMV, and SCV were inundated.

2.2 Geophysical Surveys

Field investigations included HRG marine surveys utilizing a transverse gradiometer, side scan sonar, multibeam echo-sounder, single-channel and multichannel seismic, and shallow sub-bottom profilers. This instrument array provided data on objects and seabed features exposed on the seafloor as well as characteristics of buried sediments and potential preserved, ancient submerged landform features that may be affected by the Project. The Maximum Work Area for New England Wind represents the PAPE for the Section 106 process and encompasses all areas of potential seabed disturbance associated with the WTGs, ESPs, inter-link cables, and IACs linking

the WTGs. Corridors were defined along the OECC, WMV, and SCV to encompass the PAPE for construction, operation, and decommissioning of the export cables linking the SWDA to the terrestrial electrical grid.

The transverse gradiometer consists of two marine magnetometers connected in a rigid frame utilized to detect anomalies in the earth's magnetic field produced by ferrous objects. Magnetic data were collected, saved, edited, processed, and plotted, and anomalies tabulated according to magnetic intensity (total deviation of the magnetic background measured in gammas); detectable signature duration; signature characteristics (monopolar, dipolar, and multicomponent); and location. Per BOEM guidelines, an amplitude threshold of ± 5.0 gammas was applied when analyzing magnetic anomaly significance. Most anomalies not meeting this threshold likely represent noise caused by a towfish heading error or an artifact of contouring. Actual sources producing such low-amplitude anomalies likely represent relatively small, insignificant debris sources. For the remaining magnetic anomalies above the ± 5.0 gamma threshold, analysis of the characteristics of each was undertaken and comparisons were made to verified examples of shipwreck magnetic signatures.

A side-scan sonar utilizes acoustic signals to produce an image of the seabed and any objects protruding above it. This image is ideal for detecting and recognizing submerged cultural resources exposed above the sediment. Side-scan sonar data were collected at a 30-m (98.5-ft) transect spacing, with the instrument set to collect imagery to a range of 50 m (164 ft) to either side of the towfish path (i.e., total swath width = 100 m [328 ft]). The combination of survey line spacing, range, vessel speed, and cable out allowed for nearly 100-percent imagery coverage between adjacent survey lines, including the nadir region beneath the towfish path. Side-scan sonar data from the PAPE was processed; acoustic imagery and mosaic images were reviewed to locate acoustic contacts indicative of potential submerged cultural resources exposed above the seabed. Side-scan sonar mosaics were mapped and layered to correlate with other Project data (e.g., magnetic contour maps, nautical charts, shipwreck databases, etc.). The acoustic characteristics of each individual contact were reviewed and compared to the acoustic characteristics of known shipwreck sites and other submerged cultural resources. This analysis includes the determination of linear objects, concentrated debris fields, or a potential ship-shaped outline. Potential submerged cultural resources identified in side-scan sonar imagery may have buried and or magnetic components and, therefore, correlation of the datasets is necessary when assessing acoustic contacts.

A multibeam echo-sounder assessed the current seabed conditions and collected bathymetric data throughout the project area. Acoustic reflectivity and texture of the side scan sonar data guided the sediment characterization. The seabed within the SWDA is dominated by two major sediment regions. The major seabed type is a sand with silt and exhibits a medium to low acoustic reflectivity. The second is a sand within ripple scour depressions (RSDs) characterized by a medium acoustic reflectivity. The RSDs possess coarser sand and gravel as observed in the acoustic reflectivity. The seabed across the OECC, WMV, and SCV was highly variable and included areas of coarse sediment zones, boulders, and sand waves.

A sub-bottom profiler utilizes soundwaves to penetrate the seabed in an effort to image the subsurface stratigraphy. Both shallow and deep penetration sub-bottom profiler systems were utilized during the HRG survey. Environmental conditions allowed for a maximum vertical penetration of 10 m (303 ft) by the shallow penetration sub-bottom systems which utilized 30-m (98-ft) spaced lines and up to 70 m (230 ft) by the medium penetration systems which utilized 30-m (98-ft) spaced primary and 800-950 m (2,625-3,117 ft) spaced tie lines. Processed sub-bottom profiler imagery as well as a preliminary ground-model of the PAPE were reviewed and analyzed. The spatial extents of the various horizons were reviewed, select individual profiles were analyzed, and the results of the available geotechnical results were compared to the geophysical data to identify potential geomorphic features of archaeological interest and man-made features that are indicative of potential submerged cultural resources buried beneath the seabed.

Sub-bottom imagery assists in the assessment of the preserved, submerged landscape and how it was affected by the dynamic environment. The sub-bottom horizons were mapped and layered with other Project data and correlated to the various datasets. Although the swath for data collected by the sub-bottom profiler is narrow, this subsurface dataset can also assist the assessment of potential submerged cultural resources observed in the magnetic and side-scan sonar records. If a potential resource is located directly beneath the sub-bottom, it may be displayed in the acoustic imagery. Processed sub-bottom profiler imagery could potentially indicate the burial depth of a magnetic anomaly's source or the buried extent of an acoustic contact.

The Project footprint crosses numerous submerged cable crossings, many of these cables were observed in the magnetic and acoustic record. Analysis of the HRG survey data identified potential submerged cultural resources within the SWDA, OECC, WMV, and SCV.

2.3 Geotechnical Investigations

The potential for geomorphic features of archaeological interest within the PAPE was assessed through the integration of vibracore sampling, ground modelling, and sub-bottom imagery. Based on analyses of the HRG survey data and in consultation with tribal representatives, 152 shallow geotechnical samples (collocated cone penetration tests and vibracores) were obtained for geoarchaeological assessment within the SWDA, 63 were from within the OECC, 8 from the WMV, and 45 from within the SCV. Coring was used to identify possible geomorphic features of archaeological interest (potential ancient submerged landform features) and ground truth the geophysical data. The combined geophysical and geotechnical datasets were critical in the development of the paleolandscape reconstruction describing the character of the once-exposed ancient landscapes within the project area and the refinement of the geologic context used by archaeologists to assess where parts of the ancient landscapes may be preserved.

Additionally, bathymetric data and seabed characterization provide initial windows into the potential preservation potential of buried paleolandscape features. The OECC route bathymetry increases fairly uniformly from less than 1 m near the proposed landfall to 49.5 m (3.3 to 162 ft) mean low low water (MLLW) at its termination point in the SWDA; water depths over the WMV

range from 10 to 32 m (33 to 105 ft). The seafloor over the SCV consists of both rocky and sandy terrain, with water depths varying from 12 to 40 m (39 to 131 ft). The SWDA bathymetry ranges from -43 m (141 ft) MLLW to -64 m (-209 ft) MLLW with the northeast portion of the SWDA presenting the shallowest depths with a shallow grade trending toward the southwest where the deepest portions of the SWDA exist. The seafloor along the OECC is primarily a fine-grained muddy, sandy seafloor transitioning to more sandy sediments as it exits Nantucket Sound, with sporadic sand waves and coarser grained deposits and boulders visible across the corridor. The seafloor along the SWDA is primarily sand with variable fines typically comprised of inorganic silt.

The completed MARAs indicate that geomorphic features of archaeological interest (potential ancient submerged landforms) are present within the SWDA, OECC, WMV, and SCV.

The majority of the Project's seafloor disturbance is related to OECC cable installation and limited to shallow burial depths of 1.5 to 2.5 m (5.0 to 8.0 ft) below seabed (bsb) with limited anchoring estimated to impact the uppermost 3 m (10 ft) of sediment; limited dredging to maximum depths of 8 m (26.2 ft) may be necessary within areas overlain by sand waves. These same impacts are anticipated to occur should either the WMV or SCV be used. Within the SWDA, seafloor disturbance could be up to 85 m (279 ft) for WTG and ESP foundations. Four stratigraphic units were identified within the SWDA and OECC corridors that have moderate to high potential to contain preserved buried paleolandscape features available for human occupation, the Central Channel Horizon, the Southern Channel Horizon, the Northern Channel horizon, and the Pre-Transgression Channel Horizon; a different naming convention is used in the OECC, MWV, and SCV MARAs but generally adheres to this typology. Based on the lithostratigraphic sequence, the margins of these paleochannels would have been sub-aerially exposed prior to the inundation of the SWDA. Preserved areas along these paleochannels possess moderate to high potential to contain intact submerged ancient landforms. Identified ASLFs do not represent archaeological sites, rather they are preserved portions of a landscape that was available for human occupation and that may contain archaeological sites.

3.0 CONCLUSIONS AND RECOMMENDATIONS

SEARCH and G&P's analyses indicate that several potential shipwreck/shipwreck sites and preserved geomorphic features of archaeological interest (ancient submerged landform features) identified in the HRG surveys exist within the SWDA, OECC, WMV, and SCV.

While no direct evidence of pre-contact Native American settlements or other types of cultural sites was identified within the PAPE, the survey did indicate that the project area was an exposed terrestrial landscape following the LGM approximately 24,000 years ago, and before being inundated during marine transgression. Portions of the OECC, WMV, and SCV could have remained as exposed subaerial landforms until 3,000 years ago when sea levels neared modern levels. This suggests that the landscape could have supported Native American populations during the Paleoindian and Archaic periods. The identified geomorphic features of archaeological interest within the SWDA, OECC, WMV, and SCV have the potential to contain Native American sites associated with settlements or other uses of the formerly terrestrial landscapes. SEARCH and G&P recommend avoidance of the identified geomorphic features of archaeological interest located within the PAPE. If avoidance of these identified potentially archaeologically sensitive areas is not possible, mitigation will be required. Accordingly, a Historic Property Treatment Plan (HPTP) is being developed to address mitigation for submerged ancient landforms that cannot be avoided. Consultations are ongoing among BOEM, Park City Wind LLC, Native American tribes, and other parties as part of the Section 106 process.

Analysis of the HRG survey data identified potential submerged historic cultural resources (shipwrecks or potential shipwrecks) within the SWDA, OECC, WMV, and SCV. SEARCH and G&P recommend that all identified shipwreck sites be avoided by a minimum 50-meter (164-foot) buffer calculated from the maximum discernable extent of the remains to avoid potential adverse effects to these resources. The Proponent anticipates that it will avoid these potential shipwrecks/shipwreck sites. No further archaeological investigations of the shipwrecks or possible shipwrecks are recommended unless these resources cannot be avoided.

The Proponent has prepared a plan for unanticipated discoveries that provides procedures to guide the discovery of unanticipated archaeological sites, historic sites, and submerged cultural resources, including human remains. This plan is included as Appendix H of the MARA (see COP Volume II-D).