SOUTHCOAST WIND

Construction and Operations Plan

Volume 1

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Construction and Operations Plan

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[1] On February 1, 2023, Mayflower Wind Energy LLC (Mayflower Wind) officially changed its name to SouthCoast Wind Energy LLC (SouthCoast Wind). The Mayflower Wind name has been updated to SouthCoast Wind throughout the COP and recently updated appendices; however, appendices containing documents executed prior to February 1, 2023 may still reference Mayflower Wind.

EXECUTIVE SUMMARY

The SouthCoast Wind Energy LLC (SouthCoast Wind [formerly known as Mayflower Wind]) Construction and Operations Plan (COP) is being submitted to the Bureau of Ocean Energy Management (BOEM) to support the siting and development of the SouthCoast Wind Project (Project). This COP was prepared in accordance with Title 30 of the Code of Federal Regulations (CFR) Parts 285 and 585 and BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* (BOEM, 2020). BOEM is expected to be the lead federal agency during the review of the proposed Project under the National Environmental Policy Act (NEPA).

SouthCoast Wind was one of the winning bidders during a lease auction conducted by BOEM in December 2018. The Commercial Lease of Submerged Lands for Renewable Development on the Outer Continental Shelf OCS-A-0521 (Lease Area) was executed and became effective on April 1, 2019 (BOEM, 2019). The proposed Project is intended to address the needs identified by the Massachusetts electric distribution companies for new sources of power generation that are cost-effective and reliable, as well as the needs of the 83C offshore wind mandate. SouthCoast Wind will also help the Massachusetts, Rhode Island, and New England electric distribution companies achieve renewable energy obligations for sellers of electricity as per Massachusetts General Law, Chapter 25A Section 11F, and will further the attainment of goals, mandates, and policies in the Massachusetts Global Warming Solutions Act (*Chapter 298 of the Acts of 2008, An Act Establishing the Global Warming Solutions Act*). Additionally, since the 2014 passage of the *Resilient Rhode Island Act*, Rhode Island General Law § 42-6.2, which was amended by the *2021 Act on Climate*, the State has been committed to reducing reliance on fossil fuels and reducing Green House Gas emissions. Finally, the proposed Project will contribute toward realizing the increase in clean energy generation needed to meet national climate goals and also support the federal need for grid reliability, as set forth the Federal Power Act in Section 215 (Congressional Research Services, 2020).

SouthCoast Wind will support generation reliability in Massachusetts, Rhode Island, and in the New England region, while meeting the Commonwealth of Massachusetts' and Rhode Island's statutory need for renewable/clean energy. The SouthCoast Wind Project also supports the federal need for grid reliability, as set forth the Federal Power Act in Section 215 (Congressional Research Services, 2020). As a result of the 2024 Tri-State Offshore Wind Solicitation, SouthCoast Wind was selected to deliver 1,087 megawatts (MW) to the Commonwealth of Massachusetts and 200 MW to the State of Rhode Island. This combined 1,287 MW amount represents the total capacity for the SouthCoast Wind 1 Project.

SouthCoast Wind proposes to develop the entire Lease Area as an offshore wind renewable energy project, referred to as "the Project." Construction and installation of the SouthCoast Wind 1 Project is anticipated to commence no earlier than 2025 and be commissioned and operational in 2030. Following the Project Design Envelope (PDE) guidelines set forth by BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (BOEM, 2018), SouthCoast Wind has selected a range of Project components and activities to be included in this COP. The Project components and locations described within the SouthCoast Wind PDE have been selected based on environmental and engineering site characterization studies completed to date and are informed by discussions with the supply chain about commercial availability. These will be refined in the Facility

Design Report and Fabrication and Installation Report, which will be reviewed by BOEM pursuant to 30 CFR §§ 285.700-702 before the commencement of installation.

The Lease Area encompasses 127,388 acres (51,552 hectares) located in federal waters off the southern coast of Massachusetts, 26 nautical miles (nm, 48 kilometers [km]) south of Martha's Vineyard and 20 nm (37 km) south of Nantucket, Massachusetts. There will be up to 149 positions in the Lease Area to be occupied by wind turbine generators (WTGs) and offshore substation platforms (OSPs). The 149 positions will conform to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout with an east-west and north-south orientation across the entire Massachusetts Rhode Island Wind Energy Area (MA/RI WEA), as agreed upon by SouthCoast Wind and the other MA/RI WEA leaseholders. WTGs and OSPs will be connected via inter-array cables within the Lease Area.

The Project will include one preferred export cable corridor making landfall and interconnecting to the ISO New England Inc. (ISO-NE) grid at Brayton Point, in Somerset, Massachusetts. This preferred export cable corridor to Brayton Point will be used for both Project 1 and Project 2 to be built out within the SouthCoast Wind Lease Area. The Project will also include one variant export cable corridor which, if utilized, would make landfall and interconnect to the ISO-NE grid in the town of Falmouth, Massachusetts. In the event that technical, logistical, grid interconnection, or other unforeseen challenges arise during the design and engineering phase that prevent Project 2 from making interconnection at Brayton Point, Project 2 will utilize the Falmouth variant export cable corridor and make landfall and interconnect in Falmouth, Massachusetts. An overall site plan of the proposed Project is shown in **Figure ES-1**. The Falmouth Onshore Project Area is shown in **Figure ES-2** and the Brayton Point Onshore Project Area is shown in **Figure ES-3**. See Section 3.3, Project Components and Project Stages, for further details on the proposed PDE.

Within the Falmouth export cable corridor, up to five submarine offshore export cables, including up to four power cables and up to one dedicated communications cable, may be installed from one or more OSPs within the Lease Area in federal waters, and run through Muskeget Channel into Nantucket Sound in Massachusetts state waters, to make landfall in Falmouth, Massachusetts. The three landfall sites under consideration include coastal locations at the end of Worcester Avenue, Central Park, and Shore Street.

Within the Brayton Point export cable corridor, up to six submarine offshore export cables, including up to four power cables and up to two dedicated communications cables, will be installed from one or more OSPs within the Lease Area in federal waters, and run through the Sakonnet River, make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, which includes an underground onshore export cable route, and then into Mount Hope Bay, to make landfall at Brayton Point in Somerset, Massachusetts. The two landfall sites under consideration include developed coastal locations on either side of Brayton Point; the Western landfall from the Lee River and the Eastern landfall from the Taunton River.

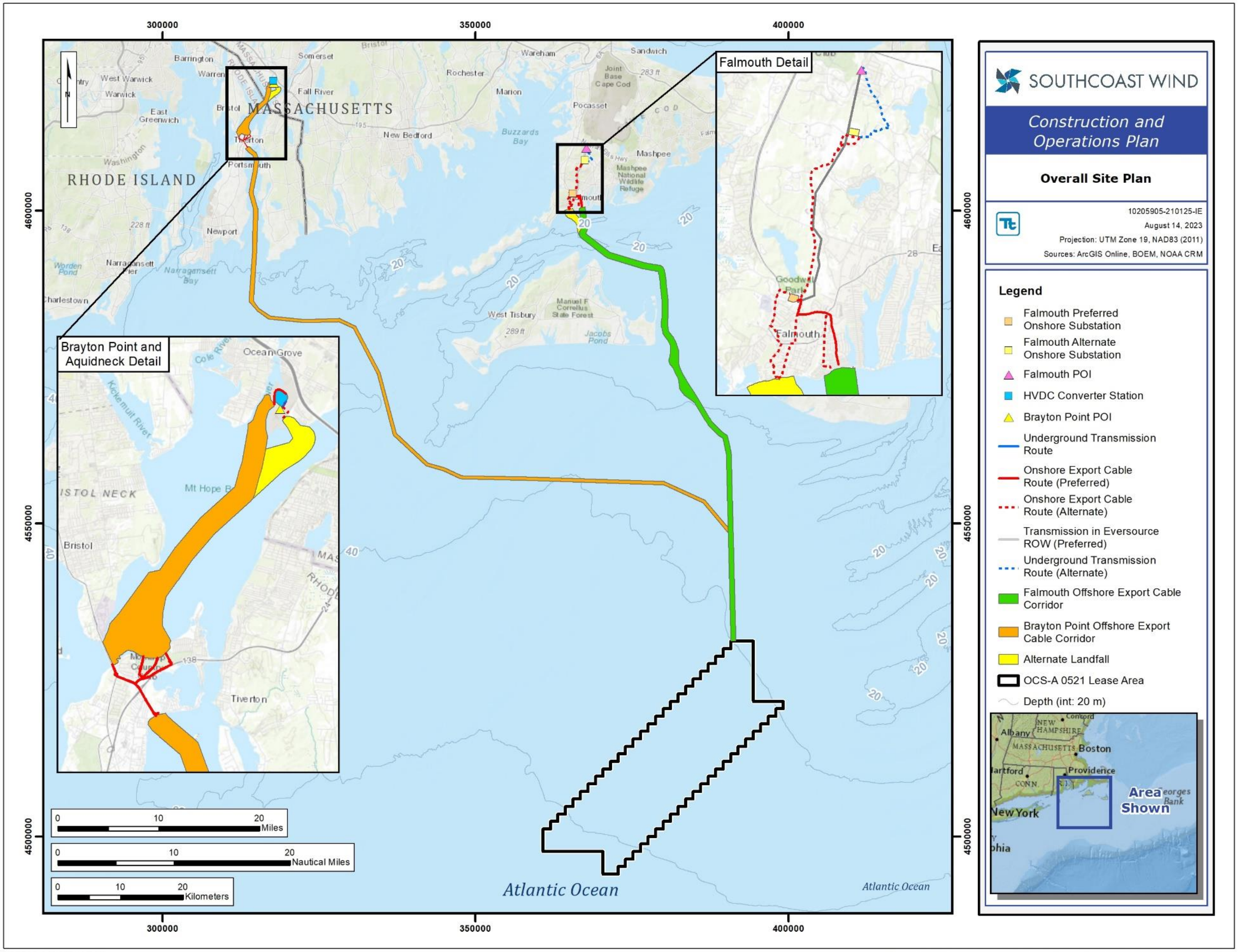
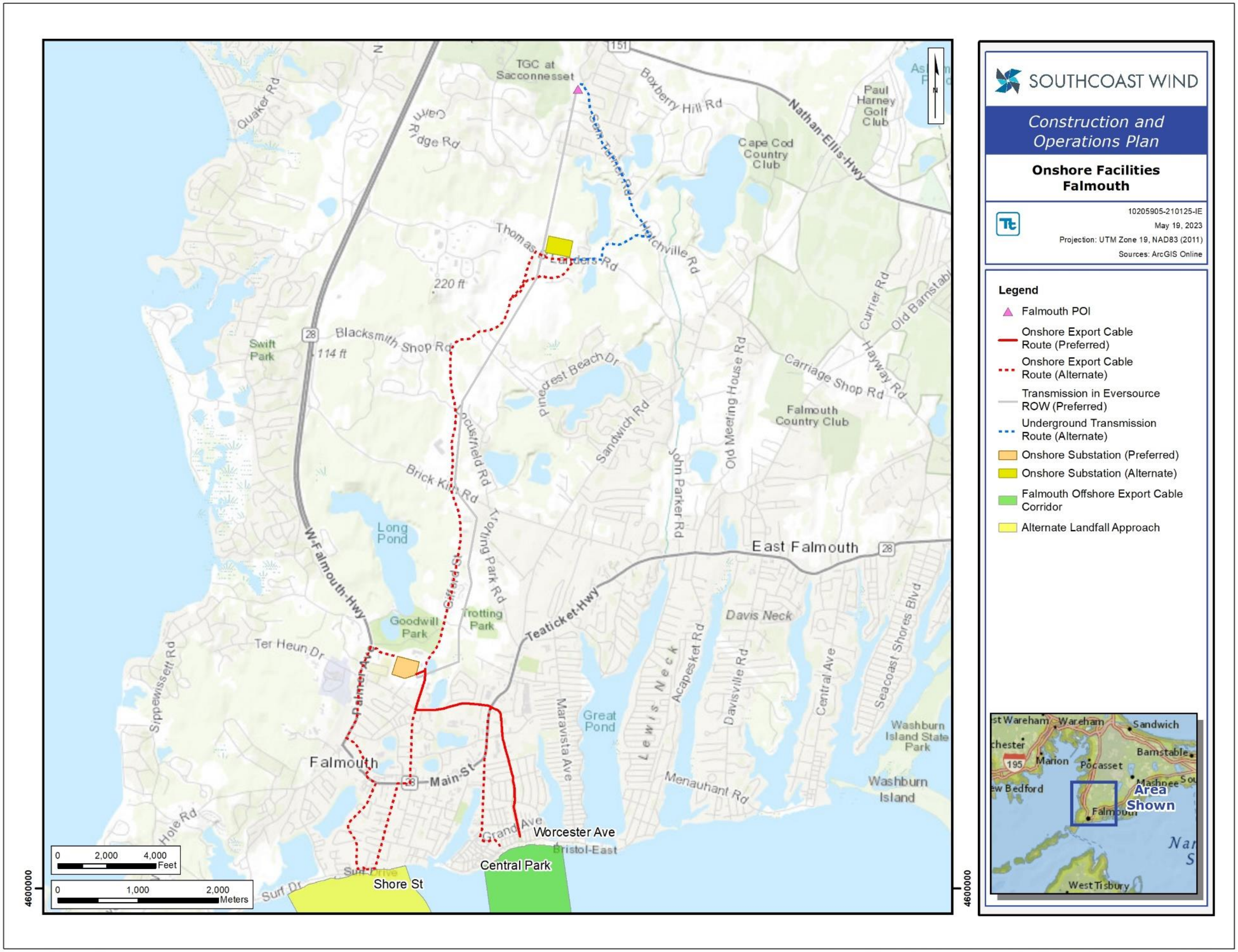


FIGURE ES-1. OVERALL SITE PLAN FOR THE PROPOSED PROJECT



NOT FOR CONSTRUCTION

FIGURE ES-2. FALMOUTH ONSHORE FACILITIES FOR THE PROPOSED PROJECT

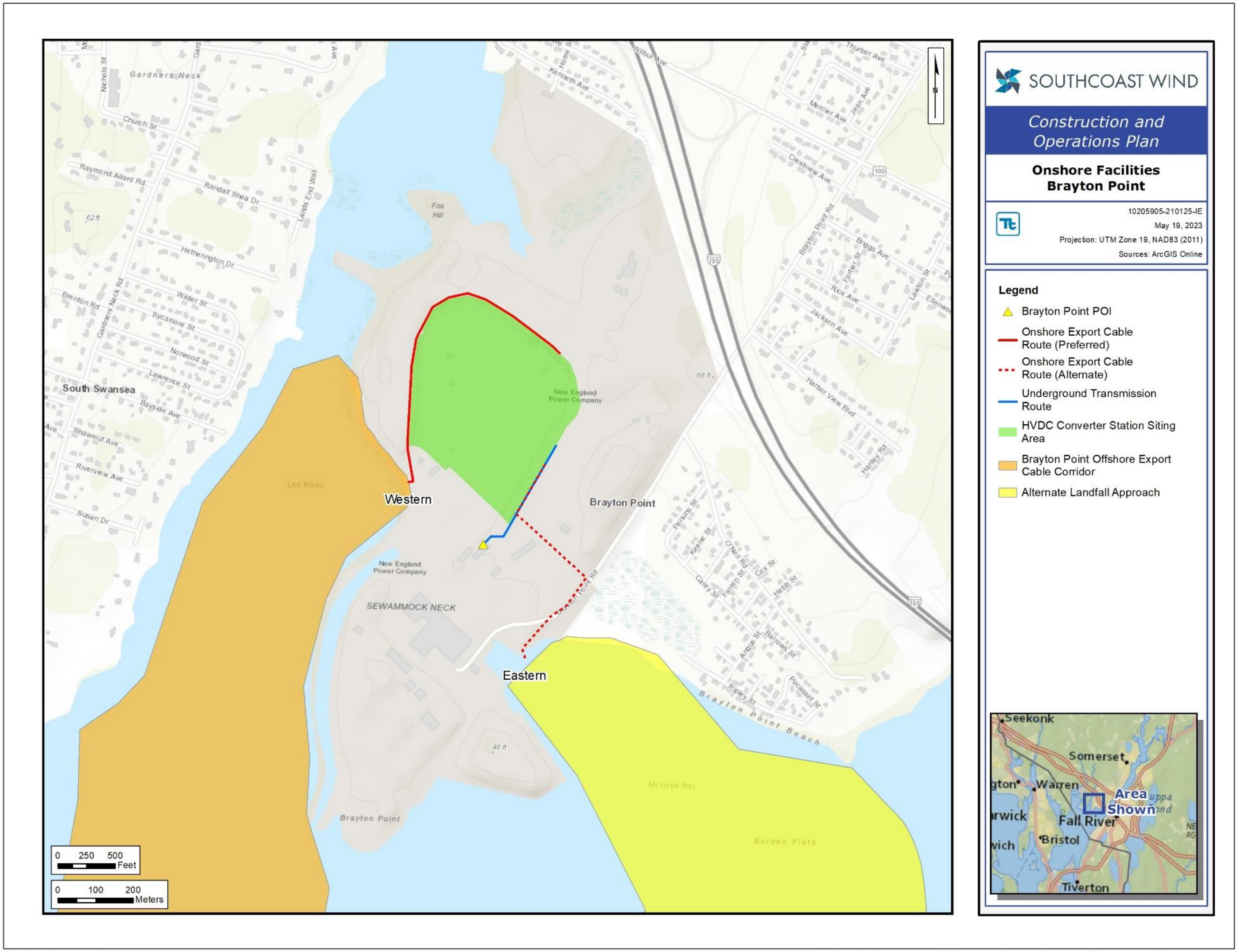


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FIGURE ES-3. BRAYTON POINT ONSHORE FACILITIES FOR THE PROPOSED PROJECT

SouthCoast Wind will utilize horizontal directional drilling for the sea-to-shore transition of export cables between the ocean and the land. From the landfall site in Falmouth, up to 12 new underground onshore export power cables will transmit the proposed Project's electric generation to a new SouthCoast Wind-developed onshore substation. The onshore export cables may travel underground from the landfall location to the newly constructed onshore substation, located in Falmouth, Massachusetts. There are two onshore substation locations under consideration in Falmouth, Massachusetts. The onshore substation will transform the export cable voltage to 345 kilovolts (kV) to enable connection to the transmission line. Eversource Energy (Eversource) will be responsible for designing, permitting, constructing, and operating the overhead transmission line within Eversource Right-of-Way #341 that will connect the proposed onshore substation to the existing Point of Interconnection (POI) at Falmouth Tap in Falmouth, Massachusetts. Alternatively, the Project is also considering an underground transmission route which would connect the onshore substation to the Falmouth POI.[2] Collectively, these onshore components in Falmouth, Massachusetts are referred to as the Falmouth Onshore Project Area.

For the offshore export cable landfall sites at Brayton Point in Somerset, Massachusetts, up to four new underground onshore export power cables will transmit the Project's high-voltage direct-current (HVDC) electric generation to two new, SouthCoast Wind-developed onshore HVDC converter stations. The onshore converter stations are specialized electrical substations designed to convert the HVDC power from the export cables to high-voltage alternating-current power to enable interconnection to the existing transmission infrastructure. The new underground 345-kV transmission line will be constructed entirely within the previously disturbed, industrial Brayton Point property. The underground transmission line will connect the converter stations to the existing National Grid Substation at Brayton Point in Somerset, Massachusetts, the Brayton Point POI. Collectively, these onshore components at Brayton Point in Somerset, Massachusetts are referred to as the Brayton Point Onshore Project Area.

Project-related activities and infrastructure elements that could produce impacts to existing conditions were identified as impact-producing factors (IPF). The purpose of identifying IPFs is to evaluate the duration of impact and spatial extent for each IPF to serve as a basis to evaluate the potential effects of the Project construction, operations and maintenance, and decommissioning on site geology, physical, biological, cultural, visual, acoustic, socioeconomic, commercial and recreational fishing, zoning and land use, navigation and vessel traffic, other marine uses, and public health and safety resources. This COP characterizes Project effects on those listed resources within or in the vicinity of the Project Area. This approach includes three primary steps:

- Identification and characterization of IPFs,
- Identification of potentially affected resources, and
- Effect characterization.

The BOEM 2020 COP Guidelines identify the IPFs listed below for offshore wind projects:

- Seabed (or ground) disturbance;
- Introduced sound into the environment (in-air or underwater);
- Change in ambient lighting;

[2] *SouthCoast Wind understands the POI can be relocated based upon ISO-NE Cape Cod Resource Integration Study (Cluster Study). See Section 2.2.6 for more details.*

- Change in ambient electric and magnetic fields;
- Actions that may displace biological resources, cultural resources, or human uses;
- Actions that may cause direct injury or death of biological resources;
- Planned discharges;
- Accidental events;
- Altered visual conditions;
- Natural hazards;
- Activities that may displace or impact fishing, recreation, and tourism;
- Influx of non-local employees that could impact housing; and
- Activities that may cause conflict with temporal and seasonal space use by other authorized users of the coastal zone or Outer Continental Shelf.

Avoidance, minimization, and mitigation measures have been proposed to address identified potential effects. These measures are summarized and presented in Section 16.0, Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts. For activities related to the Offshore Project Area and Onshore Project Areas in Massachusetts and Rhode Island jurisdiction, the Massachusetts Energy Facilities Siting Board and Rhode Island Energy Facility Siting Board will lead the review of Project activities under Massachusetts General Laws Chapter 164 Section 69J and Rhode Island General Law Chapter 42-98-1 *et seq*. In addition to the federal, state, and local permits, the proposed Project will also comply with applicable provisions of the Endangered Species Act, the Marine Mammals Protection Act, the Migratory Bird Treaty Act, the Magnuson-Stevens Fishery Conservation and Management Act, the National Historic Preservation Act, the Coastal Zone Management Act, the Clean Air Act, the Rivers & Harbors Act, and the Clean Water Act.

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ACRONYMS & ABBREVIATIONS

Abbreviation	Definition
ac	acre
AC	alternating current
ADLS	Aircraft Detection Lighting System
AIS	air-insulated substation
AUV	Autonomous Underwater Vehicles
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
CRMC	Rhode Island Coastal Resources Management Council
CTV	Crew Transfer Vessel
CVA	Certified Verification Agent
CWA	Clean Water Act
CWIS	Cooling Water Intake Structure
CZM	Coastal Zone Management
DC	direct current
DMM	Discarded Military Munitions
DoD	Department of Defense
DP	Dynamic Positioning
ECC	Export Cable Corridor
EDC	Electric Distribution Company
EIR	Environmental Impact Report
EMF	electric and magnetic fields
ENF	Environmental Notification Form
EPA	U.S. Environmental Protection Agency
ERP	Emergency Response Plan
ESA	Endangered Species Act
Eversource	Eversource Energy
FAA	Federal Aviation Administration
FDR	Facility Design Report
ft	feet
ft/s	feet per second
G&G	Geophysical and Geotechnical
GBS	gravity-based structure
GIS	gas-insulated substation
ha	hectare
HDD	horizontal directional drilling

Abbreviation	Definition
HSE	Health, Safety, and Environment
HVAC	high-voltage alternating-current
HVDC	high-voltage direct-current
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IHA	Incidental Harassment Authorization
IMO	International Maritime Organization
IPF	impact-producing factors
ISO-NE	ISO-New England
kJ	kilojoule
km	kilometer
kV	kilovolt
Lease Area	OCS-A 0521 Lease Area
LOA	Letter of Authorization
m	meter
MA DMF	Massachusetts Division of Marine Fisheries
MA EFSB	Massachusetts Energy Facilities Siting Board
MA/RI WEA	Massachusetts/Rhode Island Wind Energy Area
MARIPARS	Massachusetts Rhode Island Port Access Route Study
MassDEP	Massachusetts Department of Environmental Protection
MassWildlife	Massachusetts Division of Fish and Wildlife
MBTA	Migratory Bird Treaty Act
MEPA	Massachusetts Environmental Protection Act
mG	milligauss
MGD	million gallons per day
MHC	Massachusetts Historical Commission
mi	mile
MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MW	megawatt
NEPA	National Environmental Policy Act
NHESP	Natural Heritage & Endangered Species Program
nm	nautical mile
NMFS	NOAA's National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NSRA	Navigation Safety Risk Assessment
O&M	Operations and Maintenance
OCS	Outer Continental Shelf
OEM	original equipment manufacturer
OSP	offshore substation platform

Abbreviation	Definition
OSRP	Oil Spill Response Plan
PDE	Project Design Envelope
POI	Point of Interconnection
Project	an offshore wind renewable energy generation project
RI EFSB	Rhode Island Energy Facility Siting Board
RIDEM	Rhode Island Department of Environmental Management
RODA	Responsible Offshore Development Alliance
ROV	remotely operated vessel
ROW	right-of-way
SAP	Site Assessment Plan
SMS	Safety Management System
SouthCoast Wind	SouthCoast Wind Energy LLC
SUP	Special Use Permit
U.S.C.	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
UV	ultraviolet
UXO	unexploded ordnance
WTG	wind turbine generator

1 INTRODUCTION

1.1 PROJECT OVERVIEW

This Construction and Operations Plan (COP) is being submitted by SouthCoast Wind Energy LLC (SouthCoast Wind) to the Bureau of Ocean Energy Management (BOEM) to propose the development of an offshore wind renewable energy generation project (Project) on the Outer Continental Shelf (OCS) in the Commercial Lease of Submerged Lands for Renewable Development, OCS-A 0521 (Lease Area). The Project Area encompasses all wind turbine generators (WTGs), offshore substation platforms (OSPs), substructures, inter-array cables, and offshore export cable corridors, as well as onshore components including the sea-to-shore transitions, onshore export cables, onshore substation, onshore high-voltage direct-current (HVDC) converter stations, transmission lines, points of interconnection (POIs), and any onshore facilities for construction and operation.

SouthCoast Wind utilizes the Project Design Envelope (PDE) approach in its COP to describe a reasonable range of potential design options for WTGs, OSPs, substructures, inter-array and export cable routes, onshore substation and converter station sites, onshore interconnection routes, and associated facilities. This approach has been informed by BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (BOEM, 2018).

An overview of Project components is depicted in **Figure 1-1**. WTGs capture the wind's kinetic energy when lift is created by blades that turn a rotor and create electricity. Inter-array cables deliver the electricity generated from the WTGs to the OSPs. The offshore export cables bring the energy from the OSPs to shore and make landfall via sea-to-shore transition. Onshore export cables will pass the electricity to the onshore substation or converter stations where it will then connect to transmission lines. The transmission lines connect to existing substations where electricity will enter the electric grid via the POI. Facility and component considerations for the Project Area are further described in Section 2.1, Offshore Facilities, and Section 2.2, Onshore Facilities.

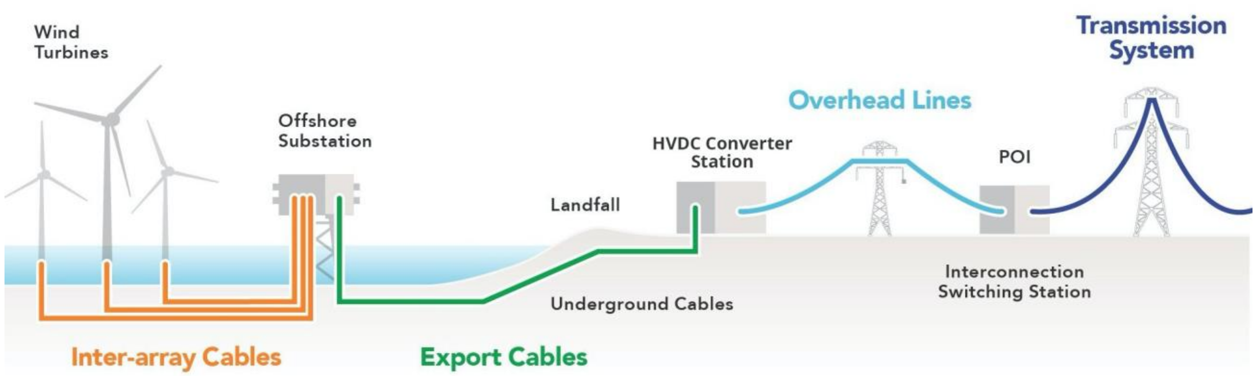

FIGURE 1-1. INDICATIVE CONCEPT OF OFFSHORE AND ONSHORE FACILITIES

1.2 SouthCoast Wind Lease Area OCS-A 0521

The SouthCoast Wind Lease was executed and became effective on April 1, 2019 (BOEM, 2019). The Lease Area is approximately 127,388 acres (ac, 51,552 hectares [ha]) located in federal waters off the southern coast of Massachusetts, approximately 26 nautical miles (nm, 48 kilometers [km]) south of Martha's Vineyard and 20 nm (37 km) south of Nantucket, Massachusetts. A map showing the location of the Lease Area, in relation to other Massachusetts and Rhode Island Wind Energy Areas (MA/RI WEAs) and the proposed Project's site overview, is shown in **Figure 1-2**.

The WTGs, OSPs, inter-array cables, and a portion of the export cables will all be located within the Lease Area. In accordance with 30 Code of Federal Regulations (CFR) § 585.200(b), SouthCoast Wind has the right to one or more Project easements for the purpose of installing gathering, transmission, and distribution cables on the OCS, if necessary. Any Project easements will be included within the Lease upon approval by BOEM.

1.3 Purpose and Need

The purpose of the proposed Project is to provide 2,400 megawatts (MW) of clean, renewable wind energy to the northeast United States, including Massachusetts and Rhode Island, which both have existing state offshore wind procurement laws in place as well as decarbonization goals and targets. As an example, in Massachusetts, in accordance with Section 83C of the Massachusetts' Green Communities Act, which allows Electric Distribution Companies (EDCs) to solicit proposals for offshore wind energy generation (*Chapter 188 of the Acts of 2016, An Act to Promote Energy Diversity*). The proposed Project addresses the needs identified by the Massachusetts EDCs for new sources of power generation that are safe, cost-effective, and reliable, as well as the needs of the 83C offshore wind mandate. SouthCoast Wind intends to help the Massachusetts EDCs achieve renewable energy obligations for sellers of electricity as per Massachusetts General Law, Chapter 25A Section 11F, and will further the attainment of goals, mandates, and policies in the Massachusetts Global Warming Solutions Act (*Chapter 298 of the Acts of 2008, An Act Establishing the Global Warming Solutions Act*). Additionally, since the 2014 passage of the *Resilient Rhode Island Act*, Rhode Island General Law § 42-6.2, which was amended by the *2021 Act on Climate*, the State has been committed to reducing reliance on fossil fuels and reducing Green House Gas emissions.

SouthCoast Wind will support generation reliability in Massachusetts, Rhode Island, and in the New England region, while meeting the Commonwealth of Massachusetts' and Rhode Island's statutory need for renewable/clean energy. The SouthCoast Wind Project also supports the federal need for grid reliability, as set forth the Federal Power Act in Section 215 (Congressional Research Services, 2020). As a result of the 2024 Tri-State Offshore Wind Solicitation, SouthCoast Wind was selected to deliver 1,087 MW to the Commonwealth of Massachusetts and 200 MW to the State of Rhode Island. This combined 1,287 MW amount represents the total capacity for the SouthCoast Wind 1 Project. This award was announced on September 6, 2024 and SouthCoast Wind is now working to negotiate and execute contracts with the Electric Distribution Companies for approval by the states' public utilities commissions.

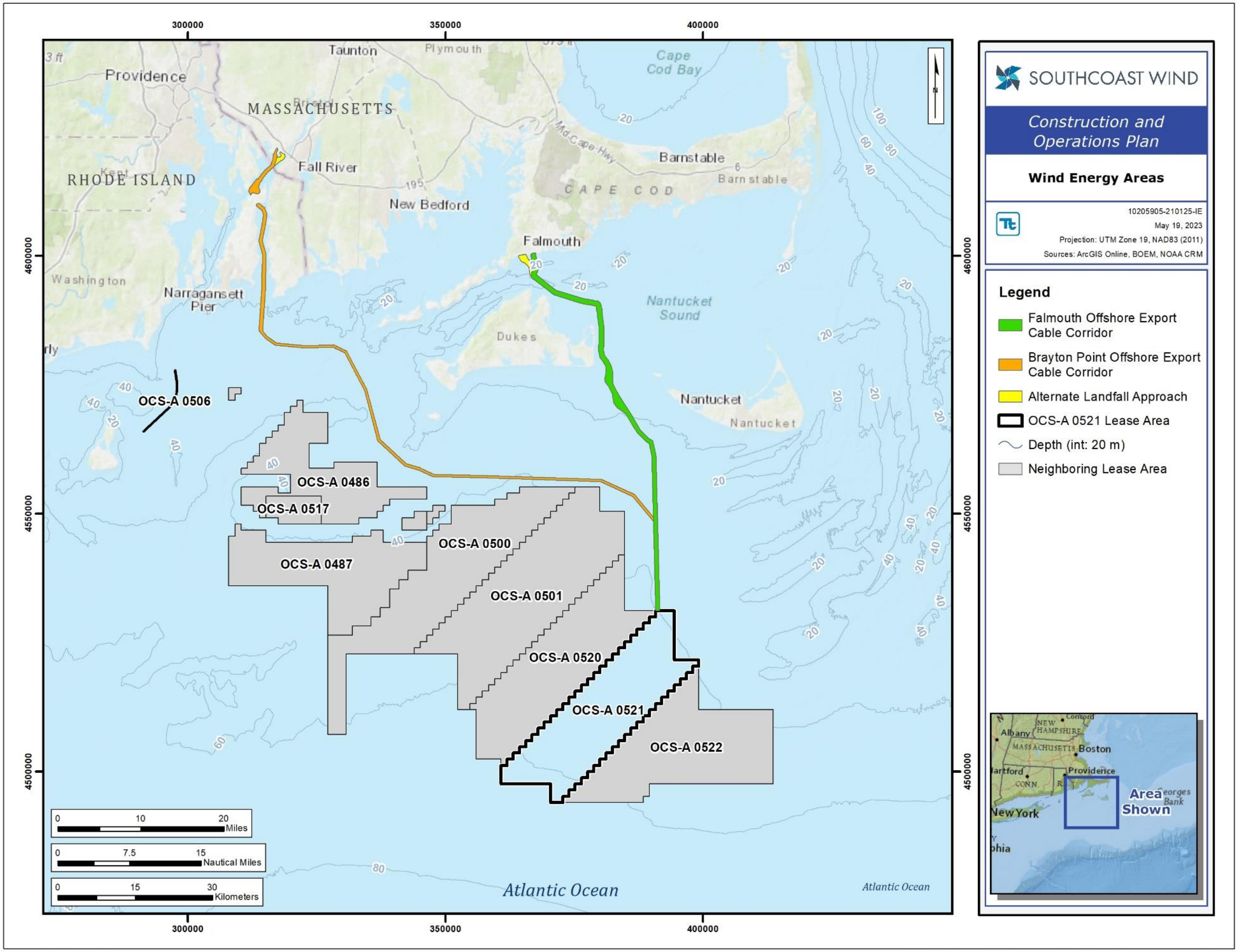

FIGURE 1-2. SOUTHCOAST WIND PROJECT OVERVIEW

Out of the 6.7 million people living in Massachusetts alone, nearly 5.1 million people live along coastal areas of the state (NOAA, 2020). Offshore wind projects like SouthCoast Wind can provide a localized energy source to coastal populations. SouthCoast Wind can take advantage of offshore wind speeds that are often higher and steadier than those on land to provide a reliable energy source (U.S. Department of Energy, 2019).

1.4 Company Overview

SouthCoast Wind is a limited liability company organized under the laws of the State of Delaware on June 7, 2018 upon filing its Certificate of Formation. SouthCoast Wind is a project fully owned by OW North America LLC (Ocean Winds), as shown in **Figure 1-3**. Ocean Winds is a 50-50 joint venture between EDPR and ENGIE. Ocean Winds and its parent companies (EDPR and ENGIE) have extensive experience financing offshore wind projects, including successful financing of 3,600 MW of offshore wind projects and over 50,000 MW of onshore renewable energy projects. This experience brings a depth of real-world experience in designing, permitting, financing, constructing, and operating wind projects.

FIGURE 1-3. SOUTHCOAST WIND ENERGY LLC OWNERSHIP

1.5 Regulatory Framework

Multiple regulatory authorities have jurisdiction over various aspects of the proposed Project as it is located on the OCS in federal waters, in waters of the Commonwealth of Massachusetts and the State of Rhode Island, and in Falmouth and Somerset, Massachusetts as well as Portsmouth, Rhode Island. SouthCoast Wind has conducted, and will continue to conduct, early and continuous engagements with federal, state, and local regulatory agencies and affected municipal boards. SouthCoast Wind understands that it is critical to seek input from regulators early in the planning process and has done so; SouthCoast Wind will continue to engage with regulators, consulting agencies, and stakeholders for the entire duration of the Project. This section lists all regulatory authorities with jurisdiction over one or more part(s) of the proposed Project and the corresponding permits, licenses, or approvals required for the construction and operation of the proposed Project (see **Table 1-1**, **Table 1-2**, **Table 1-3**, and **Table 1-4**). In the event that the Falmouth variant is utilized for Project 2, all permits identified in **Table 1-2** for Project 2 will be applied for and obtained, as needed.

This COP complies with BOEM regulations (30 CFR Subpart 585-F) and is being submitted for review and approval prior to the construction and operation of the proposed Project.

1.5.1 Other Federal Permits, Licenses, Approvals, and Consultations

TABLE 1-1. FEDERAL PERMITS, APPROVALS, AND CONSULTATIONS

Agency	Permit/License/Consultation/ Approval	Status
BOEM	Site Assessment Plan (SAP) (30 CFR §§ 585.606, 610, 611)	Approved by BOEM May 26, 2020
	Certified Verification Agent (CVA) Nomination	Approved by BOEM November 4, 2020
	Departure request for the early fabrication of SouthCoast Wind's OSP and inter-array cables	Approved by BOEM December 1, 2020
	Departure request for deferral of Lease Area geotechnical data	Approved by BOEM October 5, 2021
	COP	Submitted February 15, 2021
	National Environmental Policy Act (NEPA) Review	Initiated by BOEM November 1, 2021; Draft Environmental Impact Statement issued by BOEM on February 13, 2023
	Facilities Design Report and Fabrication & Installation Report	Filing planned for after COP approval
U.S. Department of Defense (DoD) Clearing House	Informal Project Notification Form	Submitted May 11, 2020
U.S. Army Corps of Engineers	Individual Clean Water Act (CWA) Section 404 Rivers and Harbors Act of 1899 Section 10 Permit	Submitted December 2, 2022; Application deemed complete by USACE on February 2, 2023
U.S. Coast Guard (USCG)	Private Aids to Navigation Authorization	Filing planned for 3-6 months prior to offshore construction

Agency	Permit/License/Consultation/ Approval	Status
	Local Notice to Mariners	Filing planned for prior to offshore construction
U.S. Environmental Protection Agency (EPA)	National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities	Submitted October 31, 2022; Application deemed complete by EPA on September 29, 2023; Draft permit issued by EPA on October 3, 2024.
	NPDES General Permit for Construction Activities (onshore at Brayton Point)	TBD - filing planned closer to construction start date by SouthCoast Wind.
	Outer Continental Shelf Permit Clean Air Act	Submitted November 23, 2022; Application deemed complete by EPA on April 7, 2023
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA) Section 7 Consultation Bald and Golden Eagle Protection Act (BGEPA) Migratory Bird Treaty Act (MBTA) compliance	Submitted March 9, 2023; Application deemed complete by USFWS on March 30, 2023; Consultation concluded on September 1, 2023 Basic site evaluation and characterization studies completed and detailed studies are ongoing.
National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS)	Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA)	Pre-construction: Concurrence for 2019 Geophysical and Geotechnical (G&G) surveys was issued by NMFS on July 26, 2019 IHA for 2020 Geophysical and Geotechnical surveys issued on July 23, 2020 IHA for 2021 Geophysical and Geotechnical surveys issued on July 1, 2021 IHA for 2023 Geophysical and Geotechnical surveys issued on May 12, 2023. 2023 IHA Renewal issued on October 21, 2024 LOA Application for offshore construction and operations filed March 18, 2022 and deemed complete by NMFS September 19, 2022. Proposed Rule published in Federal Register June 27, 2024.

Agency	Permit/License/Consultation/ Approval	Status
Federal Aviation Administration	Determination of No Hazard	It is not currently anticipated that a Determination of No Hazard will be required for offshore structures in the Lease Area due to their location outside of 12 nm (22 km); nor will this be required for the onshore substation or converter stations due to the maximum height of these structures. SouthCoast Wind continues to engage with the Federal Aviation Administration with regards to whether any review and/or authorization is required for offshore equipment deployed to support horizontal directional drilling (HDD) installation of the export cables.

1.5.2 State Permits, Approvals, and Consultations

TABLE 1-2. MASSACHUSETTS STATE PERMITS, APPROVALS, AND CONSULTATIONS

Agency	Permit/License/Approval	Status *Light grey = Brayton Point only* *Dark grey = Brayton Point or Falmouth[3]*
Massachusetts Executive Office of Energy and Environmental Affairs (EEA)	Massachusetts Environmental Policy Act (MEPA) Environmental Notification Form (ENF) or Environmental Impact Report (EIR) Certificate of Secretary of EEA	Project 1: SouthCoast Wind 1 ENF filed August 12, 2022; ENF Certificate of EEA Secretary issued on October 11, 2022. Filing of SouthCoast Wind 1 DEIR on February 1, 2023; DEIR Certificate of EEA Secretary issued on May 10, 2023. Filing of SouthCoast Wind 1 FEIR on July 21, 2023; FEIR Certificate of EEA Secretary issued on September 15, 2023. Filing of SouthCoast Wind 1 SFEIR on October 31, 2023; SFEIR Certificate of EEA Secretary issued on December 15, 2023.
		Project 2: ENF filing planned for Q4 2024/Q1 2025 DEIR filing planned for Q1 2025 FEIR filing planned for Q2 2025
Massachusetts Energy Facilities Siting Board (MA EFSB)	Approval to construct the proposed Project, pursuant to G.L. c. 164, 69J (Siting Petition) Certificate of Environmental and Public Need (if needed)	Project 1: SouthCoast Wind 1 EFSB Petition and Analysis filed May 27, 2022. Public Comment Hearing held October 11, 2022. Six days of evidentiary hearings concluded on August 7, 2023; Initial Brief filed on November 22, 2023; Reply Brief filed on December 6, 2023. Tentative Decision issued on September 20, 2024. Final Decision issued October 4, 2024.
		Project 2: Filing planned for Q1/Q2 2025
Massachusetts Department of Public Utilities (DPU)	Approval to construct and use the proposed Project, pursuant to G.L. c. 164, 72 (Section 72 Petition)	Project 1: SouthCoast Wind 1 petitions filed concurrently with the EFSB Petition and Analysis on May

[3] If the Falmouth variant is utilized, all Project 2 permits listed in Table 1-2 will be applied for and obtained, as needed.

Agency	Permit/License/Approval	Status *Light grey = Brayton Point only* *Dark grey = Brayton Point or Falmouth[3]*
	Individual and comprehensive exemptions from the zoning bylaws of Falmouth and/or Somerset for the proposed Project, pursuant to G.L. c. 40A, 3 (Zoning Petition)	27, 2022. Petitions consolidated with MA EFSB proceeding on July 5, 2022. Tentative Decision issued on September 20, 2024. Final Decision issued October 4, 2024.
		Project 2: Filing planned for Q1 2025.
Massachusetts Department of Environmental Protection (MassDEP)	Chapter 91 Waterways License/Permit for dredge, fill, or structures in waterways or tidelands	Project 1: Filed on December 20, 2023. Public comment period commenced April 17, 2024, ended May 24, 2024; Draft Chapter 91 License issued September 10, 2024. Final Chapter 91 Waterways License issued October 21, 2024.
		Project 2: Filing planned for near completion of MEPA process.
	Section 401 Water Quality Certification	Project 1: Filed on December 20, 2023. Secured 401 Water Quality Certification on May 7, 2024; appeals period ended on May 28, 2024.
		Project 2: Filing planned for near completion of MEPA process in 2025.
Massachusetts Office of Coastal Zone Management (CZM)	Coastal Zone Management Consistency Determination	Submitted February 15, 2021 (COP, Appendix D1). Revised version filed January 13, 2022. Executed multiple stays with MA CZM. Federal Consistency Determination Letter filed with BOEM on October 21, 2024.
Massachusetts Department of Transportation (Mass DOT)	State Highway Access/ Easement/ Right-of-Way Permit(s)	Project 1: TBD - filing planned prior to construction, if needed
		Project 2: Filing prior to construction, if needed
Massachusetts Board of Underwater Archaeological Resources (BUAR)	Special Use Permit (SUP)	
		Project 1 and 2: Provisional SUP issued on June 25, 2021. Filed MA BUAR SUP application for SouthCoast Wind 1 on August 26, 2021. SUP approved on September 30, 2021. SUP renewals were approved on September 30, 2022, September 28, 2023 and September 26, 2024. Next SUP renewal

Agency	Permit/License/Approval	Status *Light grey = Brayton Point only* *Dark grey = Brayton Point or Falmouth[3]*
		anticipated on September 26, 2025.
Massachusetts Historical Commission (MHC)	Project Notification Form/Field Investigation Permits (980 CMR 70.00)	Brayton Point Terrestrial Archaeological Resources Assessment (TARA) (Phase 1A Report) filed on March 14, 2022
		Project 1 and 2: Project Notification Form submitted July 26, 2021.
	Section 106 Consultation	Project 1 and 2: Initiated by BOEM November 1, 2021
Massachusetts Fisheries and Wildlife (MassWildlife) – Natural Heritage & Endangered Species Program (NHESP)	Conservation and Management Permit (if needed) or No-Take Determination	Project 1: NHESP issued a letter identifying species in Brayton Point Project Area on April 28, 2022 (NHESP Tracking No. 19-38917); determined that site is not mapped as Priority or Estimated Habitat.
Massachusetts Division of Marine Fisheries (MA DMF)	Letter of Authorization and/or Special License (for surveys), if needed	To be determined based on consultations with MA DMF

TABLE 1-3. RHODE ISLAND STATE PERMITS, APPROVALS, AND CONSULTATIONS

Agency	Permit/License/Approval	Status
Rhode Island Coastal Resources Management Council (CRMC)	CZM Consistency Determination under the Federal Coastal Zone Management Act (16 United States Code [U.S.C.] §§ 1451-1464) and in accordance with the Rhode Island Coastal Resources Management Program and Special Area Management Plans.	Project 1 and 2: Filed in Q3 2021 (COP, Appendix D2). Revised version filed March 16, 2022, and November 2, 2023. Federal Consistency Determination issued on December 12, 2023; CRMC Consistency Determination Letter filed with BOEM on December 19, 2023.
	Category B Assent and Submerged Lands License pursuant to R.I. Gen. Laws § 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2	Project 1: Filed on February 24, 2023. Updated filings submitted on March 6, 2023, and September 30, 2024. Project 2: Filing TBD.
	Letters of Authorization/Survey Permit, if needed, in accordance with the R.I. Gen. Laws § 46-23 and 650-RICR-20-00-1	Project 1 and 2: Approved July 7, 2021, for Summer 2021 benthic surveys. Approved February 24, 2022 for Spring 2022 benthic surveys. Updated for onshore geotechnical investigations on December 8, 2023;

Agency	Permit/License/Approval	Status
		Extension granted through the end of 2024 on March 26, 2024.
	Freshwater Wetlands Permit pursuant to the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-2.1 *et seq.*) (RIGL 46-23-6)	Project 1: Filed on February 24, 2023. Updated filings on March 6, 2023 and September 30, 2024. Project 2: Filing TBD
Rhode Island Energy Facility Siting Board (RI EFSB)	Certificate of necessity/public utility	Project 1: Filed May 31, 2022. Docketed as of June 24, 2022 (Docket Number SB-2022-02). A revised application was submitted on September 11, 2024. Project 2: Filing TBD
Rhode Island Historical Preservation and Heritage Commission (RI HPHC)	Permission to conduct archaeological field investigations (pursuant to the Antiquities Act of Rhode Island, G.L. 42-45 and the Rhode Island Procedures for Registration and Protection of Historic Properties).	Project 1 and 2: Marine Survey approved on July 2, 2021. Phase 1 Permit (No. 21-32) issued on December 17, 2021. Terrestrial Archaeological Resources Assessment (TARA - Phase 1A/1B Report) filed March 14, 2022. Marine Archaeological Resources Assessment (MARA) submitted March 16, 2022.
	Section 106 Consultation	Project 1 and 2: Initiated by BOEM November 1, 2021
Rhode Island Department of Environmental Management (RIDEM)	Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife	Project 1 and 2: Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022. RI Natural Heritage Program confirmed state-listed species data on February 10, 2023.
	Water Quality Certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1251 *et seq*. and RIGL § 46-12-3 and Dredging Permit pursuant to the Marine Infrastructure Maintenance Act of 1996 and RI Rules and Regulations for Dredging and the Management of Dredged Materials (R.I.G.L. §§ 46-6.1 *et seq.*) and Rhode Island Water Quality Regulations (R.I.G.L. §§	Project 1: Filed March 17, 2023. Amended application filed on October 16, 2023, and deemed complete on November 15, 2023. Public comment period commenced January 31, 2024; public hearing held February 22, 2024. 401 Water Quality Certificate and Marine Dredge Permit issued on March 14, 2024.

Agency	Permit/License/Approval	Status
	46.12 *et seq*.); (Dredging permit is issued jointly by RIDEM and CRMC under RIDEM dredging regulations).	Project 2: Filing TBD
	Rhode Island Pollution Discharge Elimination System General Permit for Stormwater Discharge Associated with Construction Activity pursuant to RIGL § 42-12 as amended	Project 1 and 2: TBD - filing planned closer to construction start date by SouthCoast Wind.
RIDEM Division of Fish & Wildlife	Letter of Authorization and/or Scientific Collector's Permit (for surveys and pre-lay grapnel run), if needed	Project 1 and 2: TBD based on consultations with RIDEM Division of Fish & Wildlife
Rhode Island Department of Transportation (RIDOT)	Utility Permit/Physical Alteration Permit pursuant to RIGL Chapter 24-8	Project 1 and 2: TBD - Filing planned prior to construction (if applicable). RIDOT issued a draft Letter of Intent to grant easement across railway on July 9, 2024.

1.5.3 Local Permits, Licenses, and Approvals

TABLE 1-4. LOCAL PERMITS, LICENSES, AND APPROVALS

Agency	Permit/License/Approval	Status
Somerset Planning & Zoning Board(s)	Local Planning/Zoning Approval(s) (if needed)	Project 1: Filed zoning exemption petition requesting individual and comprehensive zoning exemptions from Somerset zoning bylaws pursuant to G.L. c. 40A § 3 on May 27, 2022. Zoning exemption was consolidated with the MA EFSB proceeding and granted/approved on October 1, 2024; Final Decision issued on October 4, 2024. Project 2: Somerset (MA) - G.L. c. 40A § 3 petition to be filed Q1/Q2 2025.
Somerset Conservation Commission	Notice of Intent and Order of Conditions (Massachusetts Wetlands Protection Act)	Notice of Intent (NOI) filed on March 15, 2024. NOI approved on August 29, 2024. Order of Conditions issued September 9. 2024.
Swansea Conservation Commission	Notice of Intent and Order of Conditions (Massachusetts Wetlands Protection Act)	Notice of Intent filed on March 8, 2024. NOI approved on August 12, 2024. Order of Conditions issued August 29, 2024.

Agency	Permit/License/Approval	Status
Portsmouth Planning & Zoning Board(s)	Local Planning/Zoning Approval(s) (if needed)	Portsmouth (RI) – Pre-empted by RI EFSB. Consultation with the Town of Portsmouth Planning Director, planned for Q4 2024.
Portsmouth Town Council	Noise Variance	Filing planned Q4 2024 based on consultation with the Town of Portsmouth.
Portsmouth, and/or Somerset Department of Public Works, Board of Selectmen, and/or Town Council	Street Opening Permits/Grants of Location	Project 1 and 2: Portsmouth, RI TBD - filing planned closer to construction start date (if applicable). Somerset, MA – No work proposed in Somerset streets.

1.6 Agency Contacts and Stakeholder Coordination

As previously stated, SouthCoast Wind understands the importance of government agency and community stakeholder engagement and has implemented an “early and often” engagement approach. Prior to Lease auction in December 2018, SouthCoast Wind began an outreach effort with key groups, including fishing organizations, local community leaders, and appropriate government regulatory agencies. SouthCoast Wind initiated this early engagement to understand stakeholder and agency concerns, specifically the scientific, socio-economic, and environmental issues. SouthCoast Wind has reviewed the best available science and appropriate best management practices (BMP) and has identified possible solutions to these concerns.

SouthCoast Wind has consulted with the fishing industry, Native American Tribes, landowners, neighborhood associations, environmental groups, higher-education institutions, municipal government officials, state legislators, chambers of commerce, trade associations, regional science organizations, harbormasters and port managers. These engagements will, where appropriate, continue throughout the lifetime of the proposed Project. SouthCoast Wind has engaged with the below mentioned entities. A comprehensive list of government agency engagement can be found in Appendix A, Agency Correspondence:

- 300 Committee Land Trust
- 350 Cape Cod
- 401 Tech Bridge
- American Clean Power
- Association to Preserve Cape Cod
- Audubon Society (MA & RI)
- Battleship Cove
- Battleship Cove Community Boating
- Borden & Remington
- Borden Light Marina
- Bristol County Chamber of Commerce
- Bristol County Community College
- Bristol County Economic Development Consultants
- Bristol Marine
- Bristol Yacht Club
- Browning the Green Space
- Business Network for Offshore Wind
- Buzzards Bay Area Habitat for Humanity
- Buzzards Bay Coalition
- Cape and Island Self Reliance
- Cape Cod Aggregates

- Cape Cod Blue Economy Foundation
- Cape Cod Chamber of Commerce
- Cape Cod Commercial Fishermen's Alliance
- Cape Cod Commission
- Cape Cod Community College
- Cape Cod Fisheries Trust
- Cape Cod Technology Council
- Cape Light Compact
- Cape & Islands Veterans Outreach Center
- Champion High School, Brockton
- Cities of Fall River, New Bedford (Massachusetts)
- Clean Ocean Access
- Climate Action Rhode Island
- Commercial Fisheries Center of Rhode Island
- Common Fence Point Preparedness Committee
- Conservation Law Foundation
- Coonamessett Farm Foundation
- Delaware Indian Tribe
- Diman Regional Vocational-Technical High-School
- Edgartown Select Board
- Environment Rhode Island
- Environmental Business Council of New England (MA & RI Chapters)
- Environmental League of Massachusetts
- Eversource Energy
- Fall River Redevelopment Authority
- Falmouth Academy
- Falmouth Beach Committee
- Falmouth Chamber of Commerce
- Falmouth Climate Action Network
- Falmouth Community Television
- Falmouth Conservation Commission
- Falmouth Economic Development and Industrial Corporation
- Falmouth Energy Committee
- Falmouth Fireworks Committee
- Falmouth Heights Maravista Neighborhood Association
- Falmouth League of Women Voters
- Falmouth Road Race Committee
- Falmouth Running Club
- Falmouth Select Board
- Falmouth Unitarian Universalist Fellowship
- Falmouth Volunteers in Public Schools (VIPS)
- First Bristol Corporation
- First Congregational Church of Falmouth
- Fisheries Technical Working Group (New York State Energy & Research Development Authority)
- Fleet Forces Atlantic Exercise Coordination Center
- Franklin Cumming Tech
- Friends of Nobska Light
- Gladding-Hearn Shipyard
- Greater Newport Chamber of Commerce
- Green Energy Consumers Alliance
- Greentown Labs
- Harbormasters of Edgartown, Falmouth, Tisbury (Massachusetts)
- Harbormasters of Edgartown, Falmouth, Tisbury (Massachusetts)
- Harbormasters of Bristol, Little Compton, Middletown, Portsmouth, Tiverton, Warren (Rhode Island)
- InnSeason Resort Falmouth
- Innovate Newport
- Institute of Electrical and Electronics Engineers – Providence Chapter
- Joint Base Cape Cod
- KidWind Offshore Wind Academy
- King Phillip Yacht Club
- Lawrence Lynch
- MA Congressman Auchincloss
- MA/RI Joint Developer Marine Affairs Working group
- Maria Mitchell Association
- Marine Biological Laboratory
- Marine Recreational Fisheries Development Panel members and their respective affiliations

- Martha's Vineyard Climate Action Task Force
- Martha's Vineyard Fishermen's Preservation Trust
- Mashantucket Pequot Tribal Nation
- Mashpee Wampanoag Tribe
- Massachusetts Aquaculture Organization
- Massachusetts Audubon Society
- Massachusetts Bay Community College
- Massachusetts Building Trades Council
- Massachusetts Climate Education Organization
- Massachusetts Lobstermen's Association
- Massachusetts Maritime Academy
- Massachusetts Shellfish Officers Association
- MassHire Greater New Bedford Workforce Board
- Middletown High School
- Mohegan Tribe of Connecticut
- Nantucket Conservation Foundation
- Nantucket Historic District Trust
- Nantucket Land Bank
- Nantucket Planning & Economic Development Commission
- Nantucket Preservation Trust
- Nantucket Select Board
- Narragansett Indian Tribe
- National Society of Black Engineers Boston
- Navy Fleet Command
- New Bedford Light
- New Bedford Ocean Cluster
- New Bedford Port Authority
- New England Aquarium Anderson Cabot Center for Ocean Life
- New England Fishery Management Council
- New England Women in Energy & the Environment
- New York State Energy Research and Development Authority's Fisheries Working Group
- National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), Northeast Science Center
- NMFS, Protected Resources Division
- North Atlantic States Regional Council of Carpenters
- Northeastern Regional Association of Coastal and Ocean Observing Systems
- Northeastern University
- Oak Bluffs Select Board
- Old Colony Regional Vocational Technical High School
- One SouthCoast Chamber of Commerce
- Old Bedford Village Development Inc.
- Patriot Party Boats
- Piledrivers Local #56
- Point of Galilee (Rhode Island)
- Port of Stonington (Connecticut)
- Portsmouth Fire & Water District
- Portsmouth Little League
- Portsmouth Town Council
- Portsmouth Town Planner
- RENEW Northeast
- Responsible Offshore Development Alliance (RODA)/Special Initiatives for Offshore Wind
- Rhode Island Commerce Corporation
- Rhode Island Environmental Education Association
- Rhode Island Saltwater Anglers Association
- RI State Representatives Terri Cortvriend, Michelle McGaw
- RI State Senators Dawn Euer, Linda Ujifusa
- Richard Bready Mount Hope Bay Sailing and Education Center
- Riverside Marine
- Roger Williams University
- Safe Harbor Island Park
- Safe Harbor Sakonnet
- Sail Newport
- Sakonnet Yacht Club
- Save Our Bay Brayton Point
- Save the Bay (Narragansett Bay)
- SeaAhead Bluetech Innovation
- Seafarer's International Union
- SeaFreeze Ltd.

- Shinnecock Indian Nation
- Somerset Access TV
- Somerset Board of Selectmen
- Somerset Building Inspector
- Somerset Conservation Agent
- Somerset Economic Development Committee
- South Coast Chamber of Commerce
- South Coast Community Foundation
- South Coast LGBTQ+ Network
- SouthCoast Open Air Market
- St. Barnabas Episcopal Church
- Standish Boat Yard
- State (MA) Representatives Antonio Cabral, Dylan Fernandes, Carole Fiola, Patricia Haddad, David Vieira
- State (MA) Senators Julian Cyr, Susan Moran, Marc Pacheco, Michael Rodrigues
- Swansea Council on Aging
- The Town Dock
- The Nature Conservancy (MA & RI)
- Tisbury Select Board
- Tiverton Yacht Club
- Towns of Bourne, Edgartown, Falmouth, Nantucket, Oak Bluffs, Somerset, Tisbury (Massachusetts)
- Towns of Bristol, Little Compton, Middletown, Portsmouth, Tiverton, Warren (Rhode Island)
- Tufts University
- United Way of Greater Fall River
- University of Massachusetts – Dartmouth School for Marine Science and Technology, Ocean Corridor Economic Alliance Northeast
- University of Massachusetts Amherst
- University of Massachusetts Boston
- University of Massachusetts Lowell
- University of Rhode Island - Coastal Resources Center
- University of Rhode Island Research Foundation
- US Sailing
- Vinci VR
- Vineyard Power
- Wampanoag Tribe of Gay Head
- Woods Hole Group
- Wood Hole Oceanographic Institution

1.7 Authorized Representative and Designated Operators

The authorized representative of the proposed Project will be SouthCoast Wind. The contact information is detailed in **Table 1-5**.

TABLE 1-5. AUTHORIZED REPRESENTATIVE

Name of Authorized Representative	Michael Brown
Title	Chief Executive Officer
Phone Number	(503) 589-3557
Email	michael.brown@oceanwinds.com
Address	3 Center Plaza, Suite 205, Boston, MA 02108

SouthCoast Wind anticipates designating one or more affiliated entities as operators pursuant to 30 CFR § 585.405 to control and manage activities within the Lease Area. SouthCoast Wind will either submit an amendment to this COP prior to its approval or provide written notice to BOEM in accordance with 30 CFR § 585.405(e).

1.8 Financial Assurance

In compliance with BOEM regulations (30 CFR § 585.516), SouthCoast Wind will provide financial assurance issued by a primary financial institution, or other approved security, in order to guarantee the decommissioning obligation prior to Project installation.

1.9 Certified Verification Agent Nomination

As stated in BOEM regulations (30 CFR § 285.705), the certified verification agent (CVA) must certify and review the proposed facilities design, construction, installation, and maintenance plan in the Project Area for the duration of the proposed Project. The CVA's role is a key component in maintaining safety and reducing environmental risk in offshore wind projects. On November 4, 2020, SouthCoast Wind received BOEM approval of the CVA nominee, DNV. Refer to Appendix B, Certified Verification Agent, for the full nomination, qualification, and scope of work.

1.10 Design Standards

Design standards are not prescriptive in BOEM's renewable energy regulations regarding the installation of offshore wind energy projects. A single comprehensive standard for offshore wind development does not exist for U.S. offshore waters, but various International, European, and U.S. standards could be applied. For example, BOEM's COP guidelines state that "for offshore wind turbines, BOEM will accept a 'design-basis' approach whereby the applicant proposes which criteria and standards to apply, and then justifies why each particular criterion and standard is appropriate" (BOEM, 2020). Accordingly, the BOEM approved CVA will independently review and verify Project components design, fabrication, and installation (see Appendix B for further details).

1.11 Guide of Required Information for COP

TABLE 1-6. GUIDE OF REQUIRED INFORMATION FOR COP

Requirement	Compliance Location in COP
30 CFR § 585.105(a)	
1) Design your projects and conduct all activities in a manner that ensures safety and will not cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components to the extent practicable; and take measures to prevent unauthorized discharge of pollutants including marine trash and debris into the offshore environment.	Appendix B, Certified Verification Agent Appendix C, Conceptual Project Drawings Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 3.3.16, Waste Generation and Disposal Section 3.3.17, Chemical Use and Management Section 4.4, Geological Recommendations and Design Criteria Section 15.0, Public Health and Safety Section 16.0, Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts
30 CFR § 585.621(a-g)	

Requirement	Compliance Location in COP
a) The project will conform to all applicable laws, implementing regulations, lease provisions, and stipulations or conditions of the lease.	Appendix D, Coastal Zone Management Act Consistency Certification Section 1.5, Regulatory Framework Section 1.10, Design Standards Section 1.12, Commercial Lease Stipulations and Compliance
b) The project will be safe	Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Appendix X, Navigation Safety Risk Assessment Section 1.9, Certified Verification Agent Nomination Section 15.0, Public Health and Safety
c) The project will not unreasonably interfere with other uses of the OCS, including those involved with National security or defense	Appendix W, Fisheries Communication Plan Appendix X, Navigation Safety Risk Assessment Appendix Y1, Obstruction Evaluation & Air Space Analysis Appendix Y2, Air Traffic Flow Analysis Section 11.0, Commercial and Recreational Fisheries and Fishing Activity Section 13.0, Navigation and Vessel Traffic Section 14.0, Other Marine Uses (Military Uses, Aviation, Offshore Energy, and Cables and Pipelines)
d) The project will not cause undue harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance.	Appendix A, Agency Correspondence Appendix B, Certified Verification Agent Appendix C, Conceptual Project Drawings Appendix D, Coastal Zone Management Act Consistency Certification Appendix E, Marine Site Investigation Report Appendix E1, Geohazard Report for Export Cable Corridor Appendix E2, Geohazard Report for Lease Area Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Appendix F3, Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment Appendix F4, Nantucket Shoals Hydrodynamic Impacts Study Appendix G, Air Emissions Report Appendix H, Water Quality Report Appendix I1, Avian Exposure Risk Assessment Appendix I2, Bat Risk Assessment Appendix J, Terrestrial Vegetation and Wildlife Assessment Report Appendix K, Seagrass and Macroalgae Report Appendix L1, Offshore Designated Protected Areas Study Appendix L2, Onshore Protected Lands Report Appendix M, Benthic and Shellfish Resources Characterization Report Appendix N, Essential Fish Habitat Assessment and Protected Fish Species Assessment Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, NARW Monitoring and Mitigation Plan for Piling Driving Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project Appendix P2, Onshore EMF Assessment Appendix P2, High Voltage Direct Current Electric and Magnetic Field (EMF) Assessment Appendix Q, Marine Archaeological Resources Assessment Volume 1

Requirement	Compliance Location in COP
	Appendix Q.1, Marine Unanticipated Discoveries Plan Appendix Q.2, Pollen Report Appendix Q.3, Flotation Report for LA-P-20-1 Appendix Q.4, Historic Properties Treatment Plan for Ancient Submerged Landforms (ASLF) and Submerged Cultural Resources Appendix R, Terrestrial Archeological Resources Assessment Appendix R.1, Terrestrial Unanticipated Discoveries Plan Appendix R.2, Terrestrial Archaeology Phased Identification Plan Appendix R.3, Aquidneck Island Terrestrial Archaeological Monitoring Plan Appendix R.4, Historic Properties Treatment Plan for Anthony Road Archaeological Sites Appendix S, Analysis of Visual Effects to Historic Properties Appendix S.1, Analysis of Visual Effects to Historic Properties – Brayton Point Appendix S.2, Historic Properties Treatment Plan for Oak Grove Cemetery Appendix S.3, Historic Properties Treatment Plan for Nantucket Historic District Appendix S.4, Historic Properties Treatment Plan for Nantucket Sound Traditional Cultural Property Appendix S.5, Historic Properties Treatment Plan for Chappaquiddick Traditional Cultural Property Appendix T, Visual Impact Assessment Appendix U1, In-Air Acoustic Assessment Appendix U2, Underwater Acoustic Assessment Appendix V, Commercial and Recreational Fisheries Technical Report Appendix W, Fisheries Communication Plan Appendix X, Navigation Safety Risk Assessment Appendix Y1, Obstruction Evaluation & Air Space Analysis Appendix Y2, Air Traffic Flow Analysis Appendix Y3, Aircraft Detection & Lighting Study Appendix Y4, Radar Line of Sight Study Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 3.3, Project Components and Project Stages Section 4.0, Site Geology and Environmental Conditions Section 5.0, Physical Resources Section 6.0, Biological Resources Section 7.0, Cultural Resources Section 8.0, Visual Resources Section 9.0, Acoustic Resources Section 10.0, Socioeconomic Resources Section 11.0, Commercial and Recreational Fisheries and Fishing Activity Section 12.0, Zoning and Land Use Section 13.0, Navigation and Vessel Traffic Section 14.0, Other Marine Uses (Military Uses, Aviation, Offshore Energy, and Cables and Pipelines) Section 15.0, Public Health and Safety Section 16.0, Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts

Requirement	Compliance Location in COP
e) The project will use the best available and safest technology	Appendix C, Conceptual Project Drawings Section 1.10, Design Standards Section 3.3, Project Components and Project Stages
f) The project will use best management practices	Section 16.0, Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts
g) The project will use properly trained personnel	Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 15.0, Public Health and Safety
30 CFR § 585.626(a) You must submit the results and supporting data from survey investigations performed in support of the construction and operations activities you plan to conduct on your commercial lease. Your COP must include the following information:	
1) Shallow Hazards Survey: the results and supporting data should provide information sufficient to determine the presence of surface and shallow subsurface geological features and conditions and their likely effects on your proposed construction, operations, and facilities including, but not limited to:	
(i) Shallow faults;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(ii) Gas seeps or shallow gas;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(iii) Mobile sediments, slumps or slides, potentially unstable slopes, creep, karst topography;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 4.3, Physical Oceanography and Meteorology
(iv) Gas hydrates;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(v) Surface live bottoms (in particular, rock exposed at the surface and not overlain with sediment veneer), buried channels, and scour features;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment

Requirement	Compliance Location in COP
(vi) Ice scour of seabed sediments;	Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.1, Site Geology
(vii) Cables, artificial reefs, buoys, debris, and other man-made objects	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
2) Geological survey relevant to the design and siting of your facility.	
(i) Seismic activity at your proposed site;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(ii) Fault zones;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(iii) The possibility and effects of seabed subsidence;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(iv) The extent and geometry of faulting attenuation effects of geologic conditions near your site;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(v) Scour and sand waves; and	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 4.3, Physical Oceanography and Meteorology
(vi) Slope stability.	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment

Requirement	Compliance Location in COP
3) Biological survey. The results of the biological survey with supporting data. A description of the results of biological surveys used to determine the presence of:	
Live bottoms and hard bottoms;	Appendix E, Marine Site Investigation Report Appendix K, Seagrass and Macroalgae Report Appendix L1, Offshore Designated Protected Areas Study Appendix M, Benthic and Shellfish Resources Characterization Report Appendix N, Essential Fish Habitat Assessment and Protected Fish Species Assessment Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 6.5, Coastal Habitats Section 6.6, Benthic and Shellfish Resources
Topographic features	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix M, Benthic and Shellfish Resources Characterization Report Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 6.6, Benthic and Shellfish Resources
Surveys of other marine resources such as fish populations (including migratory populations).	Appendix N, Essential Fish Habitat Assessment and Protected Fish Species Assessment 6.7, Finfish and Invertebrates
Marine mammals	Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, North Atlantic Right Whale (NARW) Monitoring and Monitoring Plan for Pile Driving 6.8, Marine Mammals
Sea turtles	Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, North Atlantic Right Whale (NARW) Monitoring and Mitigation Plan for Pile Driving 6.9, Sea Turtles
Sea birds	Appendix I1, Avian Exposure Risk Assessment 6.1.2, Coastal and Marine Birds
4) Geotechnical Investigation.	
(i) The results of your investigation of the stratigraphic and geoengineering properties of the sediment that may affect the foundations or anchoring systems for your project;	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.2, Shallow Hazard Assessment Section 4.4, Geological Recommendations and Design Criteria
(ii) The results of adequate in-situ testing, boring, and/or sampling (for example, Cone Penetration Tests [CPTs], drilled borings, vibracores, etc.) at each foundation location, to examine all	Departure Request approved by BOEM on October 5, 2021

Requirement	Compliance Location in COP
important sediment and rock strata to determine its strength classification, deformation properties, and dynamic characteristics;	
(iii) The results of a sufficient number of deep soil borings (with soil sampling and testing) within the project area to determine the vertical and lateral variation in seabed conditions and to provide the relevant geotechnical data required for design. The recommended boring depth to be considered a "deep boring" is at least 10 meters deeper than the design penetration of the foundation piles but may be modified based on the consistency and strength of the sediments. For areas with highly variable subsea soil conditions, it may be appropriate to obtain a greater number of deep borings. Depending on the sediment and geologic conditions, it may be appropriate to utilize CPT probes instead of deep borings at selected locations. Justification should be provided for any variations from the basic guidelines.	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment Section 4.4, Geological Recommendations and Design Criteria
5) Archaeological Resources Survey: Your historic property identification results, supporting data, and report should identify and describe any historic properties that may be potentially affected by your proposed activities, as defined by the NHPA (16 U.S.C. §§ 470 *et seq*.). This includes, but is not limited to, historic properties that are	
(i) located onshore with a view of the proposed project;	Appendix S, Analysis of Visual Effects to Historic Properties Appendix T, Visual Impact Assessment Section 7.3, Above-Ground Historic Properties Section 8.0, Visual resources
(ii) in onshore/terrestrial areas where cables may come ashore;	Appendix R, Terrestrial Archaeological Resources Assessment Appendix R.1, Terrestrial Unanticipated Discoveries Plan Appendix R.2, Terrestrial Archaeology Phased Identification Plan Section 7.2, Terrestrial Archaeological Resources
(iii) in onshore staging areas;	Appendix R, Terrestrial Archaeological Resources Assessment Appendix R.1, Terrestrial Unanticipated Discoveries Plan Appendix R.2, Terrestrial Archaeology Phased Identification Plan Section 7.2, Terrestrial Archaeological Resources
(iv) in nearshore environments in state waters; and	Appendix R, Terrestrial Archaeological Resources Assessment Appendix Q, Marine Archaeological Resources Assessment Appendix Q1, Marine Unanticipated Discoveries Plan Section 7.1, Marine Archaeological Resources

Requirement	Compliance Location in COP
(v) in offshore areas	Appendix Q, Marine Archaeological Resources Assessment Volume I Appendix Q1, Marine Unanticipated Discoveries Plan Section 7.1, Marine Archaeology
6) Overall Site Investigation: You must prepare an overall site investigation report for your facility that integrates the findings of the shallow hazard, geological, and geotechnical surveys for a proposed project.	
(i) Scouring of the seabed	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 4.3, Physical Oceanography and Meteorology Section 4.4, Geological Recommendations and Design Criteria
(ii) Hydraulic instability	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Section 4.4, Geological Recommendations and Design Criteria
(iii) The occurrence of sand waves	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment
(iv) Instability of slopes at the facility location	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.2, Shallow Hazard Assessment
(v) Liquefaction, or possible reduction of sediment strength due to increased pore pressures	Appendix E, Marine Site Investigation Report Section 4.4, Geological Recommendations and Design Criteria
(vi) Degradation of subsea permafrost layers	Appendix E, Marine Site Investigation Report Section 4.4, Geological Recommendations and Design Criteria
(vii) Cyclic loading	Appendix E, Marine Site Investigation Report Section 4.4, Geological Recommendations and Design Criteria
(viii) Lateral loading	Appendix E, Marine Site Investigation Report Section 4.4, Geological Recommendations and Design Criteria
(ix) Dynamic loading	Appendix E, Marine Site Investigation Report Section 4.4, Geological Recommendations and Design Criteria
(x) Settlements and displacements	Appendix E, Marine Site Investigation Report Appendix E.2, Geohazard Report for Lease Area Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Appendix F3, Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment Appendix F4, Nantucket Shoals Hydrodynamic Impacts Study Section 4.3, Physical Oceanography and Meteorology

Requirement	Compliance Location in COP
(xi) Plastic deformation and formation collapse mechanisms	Appendix E, Marine Site Investigation Report Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Section 4.4, Geological Recommendations and Design Criteria
(xii) Sediment reactions on the facility foundations or anchoring systems	Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Section 4.3, Physical Oceanography and Meteorology
30 CFR § 585.626(b) Your COP must include the following project-specific information, as applicable.	
(1) Contact information	Section 1.7, Authorized Representative
(2) Designation of operator, if applicable	Section 1.7, Authorized Representative
(3) The construction and operation concept	Section 3.3, Project Components and Project Stages Appendix C, Conceptual Project Design Drawings
A discussion of the objectives	Section 1.3, Purpose and Need Section 3.3, Project Components and Project Stages
Description of the proposed activities	Section 3.3, Project Components and Project Stages
Tentative Schedule from start to completion	Section 3.2, Proposed Project Schedule
Plans for phased development, as provided in § 585.629.	N/A
(4) Commercial lease stipulations and compliance	Section 1.5, Regulatory Framework Section 1.12, Commercial Lease Stipulations and Compliance
(5) A location plat	Section 3.1, Proposed Project Location Section 3.3.5, Offshore Export Cables
(6) General structural and project design, fabrication, and installation	Section 2.0, Project Siting and Design Development Section 3.3, Project Components and Project Stages
(7) All cables and pipelines, including cables on project easements	Section 3.3.3, Offshore Substation Platform Section 3.3.4, Inter-Array Cables Section 3.3.5, Offshore Export Cables Section 3.3.6, Sea-to-Shore Transition Section 3.3.7, Onshore Underground Export Cables Section 3.3.8, Onshore Substation and HVDC Converter Station Section 3.3.9, Underground Transmission Route Section 3.3.10, Points of Interconnection Section 3.3.11, Commissioning Activities Section 3.3.12, Marking and Lighting
(8) A description of the deployment activities	Section 3.3, Project Components and Project Stages Appendix Z, Safety Management System
(9) A list of solid and liquid wastes generated	Section 3.3.17, Chemical Use and Management
(10) A listing of chemical products used (if stored volume exceeds Environmental Protection Agency (EPA) Reportable Quantities)	Section 3.3.18, Operation and Maintenance Methods
(11) A description of any vessels, vehicles, and aircraft you will use to support your activities	Section 3.3.15, Health, Safety and Environmental Protections

Requirement	Compliance Location in COP
(12) General description of operating procedures:	Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 3.3, Project Components and Project Stages Section 3.3.19, Conceptual Decommissioning
(i) Describe the operating procedures or systems you intend to use for your project under normal operating conditions;	Section 3.3, Project Components and Project Stages Section 3.3.19, Conceptual Decommissioning
(ii) Describe the procedures and systems that will be used at your facilities in the case of emergencies, accidents, or non-routine conditions, regardless of whether they are man-made or natural; and	Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 3.3, Project Components and Project Stages Section 3.3.19, Conceptual Decommissioning Section 4.3, Physical Oceanography and Meteorology
(iii) Include, as a part of non-routine conditions, descriptions of high-consequence and low probability events.	Appendix Z, Safety Management System Appendix AA, Oil Spill Response Plan Section 4.3, Physical Oceanography and Meteorology Section 15.2.1, Unplanned Events
(13) Decommissioning and site clearance procedures	Section 3.3.19, Conceptual Decommissioning
(14) List of all federal, state, and local authorizations, approvals or permits that will be required to conduct the proposed activities.	Appendix A, Agency Correspondence Appendix D, Coastal Zone Management Act Consistency Certification Appendix X, Navigation Safety Risk Assessment Section 1.5, Regulatory Framework
(15) Measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts	Section 16.0, Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts
(16) Information you incorporate by reference	Section 17.0, References
(17) List of agencies and persons with whom you have consulted or will consult about potential impacts of your proposed activities	Appendix A, Agency Correspondence Section 1.6, Agency Contacts and Stakeholder Coordination
(18) Reference	Section 17.0, References
(19) Financial assurance	Section 1.8, Financial Assurance
(20) CVA nominations for reports required in 30 CFR 585 (subpart G)	Section 1.9, Certified Verification Agent Nomination
(21) Construction schedule	Section 3.2, Proposed Project Schedule
(22) Air quality information	Appendix G, Air Emissions Report Section 5.1, Air Quality
(23) Other information	Appendix I2, Bat Risk Assessment Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project Appendix P2, High Voltage Direct Current Electric and Magnetic Field (EMF) Assessment Appendix U1, In-Air Acoustic Assessment Appendix U2, Underwater Acoustic Assessment Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis

Requirement	Compliance Location in COP
	Appendix Y4, Radar and Navigational Aid Screening Study Appendix BB, Economic Development Report
30 CFR § 585.627(a) You must submit with your COP detailed information that describes resources, conditions, and activities that could be affected by your proposed project. You should describe the environment that may be affected by your proposed activities and include a description of specific impact producing factors and activities related to your activities, including:	
(1) Hazards	Appendix E, Marine Site Investigation Report Appendix E.1, Geohazard Report for Export Cable Corridor Appendix E.2, Geohazard Report for Lease Area Appendix E.3, Measured and Derived Geotechnical Parameters and Final Results Appendix F1, Sediment Plume Impacts from Construction Activities Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure Appendix F3, Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment Appendix F4, Nantucket Shoals Hydrodynamic Impacts Study Section 4.1, Site Geology Section 4.2, Shallow Hazard Assessment Section 4.3, Physical Oceanography and Meteorology Section 4.4, Geological Recommendations and Design Criteria
(2) Water Quality	Appendix H, Water Quality Report Section 5.2, Water Quality
(3) Biological Resources a/	
i) Benthic communities	Appendix M, Benthic and Shellfish Resources Characterization Report Section 6.6, Benthic and Shellfish Resources
ii) Marine mammals	Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, North Atlantic Right Whale (NARW) Monitoring and Mitigation Plan for Pile Driving Section 6.8, Marine Mammals
iii) Sea turtles	Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, North Atlantic Right Whale (NARW) Monitoring and Mitigation Plan for Pile Driving Section 6.9, Sea Turtles
iv) Coastal and marine birds	Appendix I1, Avian Exposure Risk Assessment Section 6.1, Coastal and Marine Birds
v) Fish and shellfish	Appendix M, Benthic and Shellfish Resources Characterization Report Appendix N, Essential Fish Habitat Assessment and Protected Fish Species Assessment Section 6.6, Benthic and Shellfish Resources Section 6.7, Finfish and Invertebrates
vi) Plankton	Appendix K, Seagrass and Macroalgae Report Section 6.5, Coastal Habitats Section 6.6, Benthic and Shellfish Resources Section 6.7, Finfish and Invertebrates
vii) Sea grasses	Appendix K, Seagrass and Macroalgae Report Appendix N, Essential Fish Habitat Assessment and Protected Fish Species

Requirement	Compliance Location in COP
	Assessment Section 6.5, Coastal Habitats
viii) Other plant life	Appendix J, Terrestrial Vegetation and Wildlife Assessment Section 6.3, Terrestrial Vegetation and Wildlife Section 6.4, Wetlands and Waterbodies
(4) Threatened or endangered species a/	Appendix J, Terrestrial Vegetation and Wildlife Assessment Appendix L1, Offshore Designated Protected Areas Study Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan Appendix O.2, North Atlantic Right Whale (NARW) Monitoring and Mitigation Plan for Pile Driving Section 6.1, Coastal and Marine Birds Section 6.2, Bats Section 6.3, Terrestrial Vegetation and Wildlife Section 6.5, Coastal Habitats Section 6.7, Finfish and Invertebrates Section 6.8, Marine Mammals Section 6.9, Sea Turtles
(5) Sensitive biological resources or habitats a/	
Essential fish habitat.	Appendix N, Essential Fish Habitat Assessment and Protected Fish Species Assessment Section 6.5, Coastal Habitats Section 6.6, Benthic and Shellfish Resources Section 6.7, Finfish and Invertebrates
Refuges and preserves.	Section 12.0, Zoning and Land Use
Special management areas identified in coastal management programs, sanctuaries, rookeries.	Appendix L1, Offshore Designated Protected Areas Study Appendix L2, Onshore Protected Lands Report Section 6.5, Coastal Habitats
Hard bottom habitat.	Appendix M, Benthic and Shellfish Resources Characterization Report Section 6.6, Benthic and Shellfish Resources
Chemosynthetic communities.	Appendix K, Seagrass and Macroalgae Report
Calving grounds.	Section 6.8, Marine Mammals
Barrier islands, beaches, dunes.	Appendix J, Terrestrial Vegetation and Wildlife Assessment Section 6.3, Terrestrial Vegetation and Wildlife
Wetlands.	Section 6.4, Wetlands and Waterbodies Appendix J, Terrestrial Vegetation and Wildlife Assessment
(6) Archaeological resources	Appendix Q, Marine Archaeological Resources Assessment Volume 1 Appendix R, Terrestrial Archeological Resources Assessment Appendix S, Analysis of Visual Effects on Historic Properties Section 7.1, Marine Archaeology Section 7.2, Terrestrial Archaeology Section 7.3, Above-Ground Historic Properties
(7) Social and economic resources	Section 10.0, Socioeconomic Resources Appendix BB, Economic Development Report
(8) Coastal and marine uses	Appendix V, Commercial and Recreational Fisheries and Fishing Activity Technical Report Section 10.0, Socioeconomic Resources Section 11.0, Commercial and Recreational Fisheries and Fishing Activity Section 12.0, Zoning and Land Use

Requirement	Compliance Location in COP
	Section 14.0, Other Marine Uses (Military Uses, Aviation, Offshore Energy, and Cables and Pipelines)
(9) Consistency Certification	Appendix D, Coastal Zone Management Act Consistency Certification
(10) Other resources, conditions, and activities	Not applicable
30 CFR § 585.627(b)	
Consistency certification	Appendix D, Coastal Zone Management Act Consistency Certification
30 CFR § 585.627(c)	
Oil spill response plan	Appendix AA, Oil Spill Response Plan
30 CFR § 585.627(d)	
Safety management system	Appendix Z, Safety Management System

Note:
a/ You may combine the information provided for Biological Resources, threatened and endangered Species, and Sensitive Biological Resources and Habitats into an integrated section, provided you clearly indicate protected species.

1.12 Commercial Lease Stipulations and Compliance

Table 1-7 details the relevant Lease terms and stipulations and demonstrates compliance with the stipulations in the SouthCoast Wind Lease. SouthCoast Wind has remained in compliance with all Lease stipulations throughout the life of the Lease and will continue to comply as noted in the table below.

TABLE 1-7. LEASE TERMS AND STIPULATIONS

Lease Section	Stipulation	Compliance
Section 4(a): Payments	The Lessee must make all rent payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, unless otherwise specified in Addendum "B."	SouthCoast Wind will pay all rent obligations according to the terms of the Lease.
Section 4(b): Payments	The Lessee must make all operating fee payments to the Lessor in accordance with applicable regulations in 30 CFR Part 585, as specified in Addendum "B.”	SouthCoast Wind will pay all operating fee obligations according to the terms of the Lease.
Section 5: Plan	The Lessee may conduct those activities described in Addendum “A” only in accordance with an SAP or COP approved by the Lessor. The Lessee may not deviate from an approved SAP or COP except as provided in applicable regulations in 30 CFR Part 585.	SouthCoast Wind will adhere to approved SAP and COP activities in the Project Area.
Section 6: Associated Project Easements	Pursuant to 30 CFR § 585.200(b), the Lessee has the right to one or more project easements, without further competition, for the purpose of installing, gathering, transmission, and distribution cables, pipelines, and appurtenances on the OCS, as necessary for the full enjoyment of	SouthCoast Wind will acquire the necessary easement rights to install the offshore transmission cable within Massachusetts and Rhode Island state waters, in accordance with Massachusetts General Laws Chapter 91 and 310 CMR 9.00, and after review of the state portions of

Lease Section	Stipulation	Compliance
	the lease, and under applicable regulations in 30 CFR Part 585. As part of submitting a COP for approval, the Lessee may request that one or more easement(s) be granted by the Lessor. If the Lessee requests that one or more easements be granted when submitting a COP for approval, such project easements will be granted by the Lessor in accordance with the Act and applicable regulations in 30 CFR Part 585 upon approval of the COP in which the Lessee has demonstrated a need for such easements. Such easements must be in a location acceptable to the Lessor and will be subject to such conditions as the Lessor may require. The project easements that would be issued in conjunction with an approved COP under this lease will be described in Addendum "D" to this lease, which will be updated as necessary.	the proposed Project by the Executive Office of Energy and Environmental Affairs under the MEPA, and by the MA EFSB and RI EFSB. MassDEP and CRMC will issue a license that grants SouthCoast Wind permission to locate offshore export cables in state waters.
Section 7: Conduct of Activities	The Lessee must conduct, and agrees to conduct, all activities in the leased area in accordance with an approved SAP or COP, and with all applicable laws and regulations.	SouthCoast Wind will adhere to approved SAP and COP activities in the Lease Area.
Section 10: Financial Assurance	The Lessee must provide and maintain at all times a surety bond(s) or other form(s) of financial assurance approved by the Lessor in the amount specified in Addendum "B".	SouthCoast Wind will abide by the Lease stipulations for financial assurance.
Section 13: Removal or decommission of Leased Area	Unless otherwise authorized by the Lessor, pursuant to the applicable regulations in 30 CFR Part 585, the Lessee must remove or decommission all facilities, projects, cables, pipelines, and obstructions and clear the seafloor of all obstructions created by activities on the leased area, including any project easements within two years following lease termination, whether by expiration, cancellation, contraction, or relinquishment, in accordance with any approved SAP, COP, or approved Decommissioning Application, and applicable regulations in 30 Part CFR 585.	SouthCoast Wind will submit a Decommissioning Application at the end of the proposed Project's life and adhere to the approved Decommissioning Plan.
Section 14: Safety Requirements	The Lessee must:	SouthCoast Wind will submit and adhere to the Safety Management

Lease Section	Stipulation	Compliance
	(a) Maintain all places of employment for activities authorized under this lease in compliance with occupational safety and health standards and, in addition, free from recognized hazards to employees of the Lessee or of any contractor or subcontractor operating under this lease; (b) Maintain all operations within the leased areas in compliance with regulations in 30 CFR Part 585 and orders from the Lessor and other Federal agencies with jurisdiction, intended to protect persons, property, and the environment on the OCS; and (c) Provide any requested documents and records, which are pertinent to occupational or public health, safety, or environmental protection, and allow prompt access, at the site of any operation or activity conducted under this lease, to any inspector authorized by the Lessor or other Federal agency with jurisdiction.	System (SMS), described within Appendix A, to Bureau of Safety and Environmental Enforcement, pursuant to Section 388 of the Energy Policy Act of 2005.
Section 15: Debarment Compliance	The Lessee must comply with the Department of the Interior's non-procurement debarment and suspension regulations set forth in 2 CFR 180, 1400 and must communicate the requirement to comply with these regulations to persons with whom it does business related to this lease by including this requirement in all relevant contracts and transactions.	SouthCoast Wind will comply with the requirements related to debarment and suspension regulations and make all such required communications.
Section 16: Notices	During the performance of this lease, the Lessee must fully comply with paragraphs (1) through (7) of section 202 of Executive Order 11246, as amended (reprinted in 41 CFR §§ 60-1.4(a)), and the implementing regulations, which are for the purpose of preventing employment discrimination against persons on the basis of race, color, religion, sex, or national origin.	It is the policy of SouthCoast Wind to ensure equal employment opportunity without discrimination or harassment on the basis of race, color, religion, sex, sexual orientation, gender identity or expression, age, disability, marital status, citizenship, national origin, genetic information, or any other characteristic protected by law. SouthCoast Wind prohibits any such discrimination or harassment.
Addendum "B", Section III (Payments): Financial Schedule	Unless otherwise authorized by the Lessor in accordance with the applicable regulations in 30 CFR Part 585, the Lessee must make payments as described in Lease Agreement.	SouthCoast Wind will pay all financial obligations according to the terms of the Lease.

2 PROJECT SITING AND DESIGN DEVELOPMENT

The purpose of this section is to describe which component and siting designs SouthCoast Wind carefully considered for the proposed Project. Potential Project components and sites are stated to either be included or excluded from the PDE, which is carried forward for analysis in the remainder of the COP. Various reasons may drive the elimination of design alternatives, including, but not limited to the need to minimize cost and environmental impacts, space availability, and technological incompatibility with the proposed Project's needs. Section 2.1 addresses the proposed Project's offshore design alternatives and Section 2.2 addresses onshore design alternatives.

Section 3.0 describes component and siting designs under consideration for the proposed Project. SouthCoast Wind is utilizing a PDE approach; see Section 3.3 for detailed PDE information, which allows for a range of site and component parameters to be permitted.

2.1 OFFSHORE FACILITIES

The offshore Project components include WTGs, substructures, OSPs, inter-array cables, and offshore export cables. As discussed below, considerations related to the Lease Area's depth, sea floor conditions, protected areas, and applicable regulations, provide clarity to site-specific technologies and processes SouthCoast Wind can reasonably utilize within the Project Area. SouthCoast Wind also considered commercial and technical availability in evaluating Project components. The subsections below also detail options no longer under consideration for the proposed Project's PDE.

2.1.1 Wind Turbine Generators

SouthCoast Wind is selecting WTGs based on available technology and feasibility for the proposed Project. The WTGs initially considered varied based on the size of the rotor diameter. There are tradeoffs for selecting WTG models; most notably, WTGs with larger rotor diameters will yield more power, but involve larger foundations to accommodate their size. Advancing WTG technology will lead to more efficient WTGs (with larger rotor diameters) to be available on the market prior to construction.

2.1.1.1 Wind Turbine Generators Selected for PDE

As WTG technology advances, SouthCoast Wind will select larger WTGs, such as those with rotor diameters up to 919 feet (280 m). Section 3.3.2 further describes the WTG parameters which SouthCoast Wind has selected for the PDE.

2.1.2 Site Layout

Site layout for an offshore wind project depends on a variety of factors, including sea floor conditions and navigation safety. Obstructions, sea floor slope, shipwrecks, shoal features, and seabed conditions will impact the placement of WTGs, OSPs, inter-array cables, and offshore export cables for the Project layout. Layouts must also include multiple options because some pre-planned WTG or OSP locations may be deemed unusable as additional site characterization information is collected.

The Responsible Offshore Development Alliance (RODA) proposed two layouts to the United States Coast Guard (USCG) for WTGs within the seven MA/RI WEAs. Each layout had a 1 nm x 1 nm (1.9 km x 1.9 km) grid layout, with the first layout including six, 2 nm wide transit corridors and the second layout including six, 4 nm wide transit corridors (RODA, 2020). An example of the 4 nm layout can be seen in **Figure 2-1.**

Importantly, the USCG Massachusetts and Rhode Island Port Access Route Study (MARIPARS) report concluded that 1 nm wide, east-to-west paths (to which the MA/RI WEA leaseholders have committed) would facilitate traditional fishing methods. The USCG also concluded that 1 nm wide, north-to-south paths would provide adequate access for search and rescue access, and that 0.6 to 0.8 nm wide, northwest-to-southeast paths would allow commercial fishing vessels to traverse from their port(s) through the lease areas to fishing grounds, all in a predictable and safe manner and without the need for additional routing measures (USCG, 2020). These three lines of orientation more than satisfy published USCG standards for safe navigation in development of offshore wind (USCG, 2019).

Additional transit lanes beyond the ample sea space provided in the predictable and measured 1 nm x 1 nm (1.9 km x 1.9 km) grid would unquestionably hinder, and in cases like SouthCoast Wind, decimate the delivery of contracted electricity supply to the market and put New England's energy security at risk.

Less clean energy would be produced in the region if numerous, wide, transit lanes were established through the lease areas. Notably, the capacity within the MA/RI WEA would be reduced by approximately 3,300 MW, which is 500 MW less than current state demand for offshore wind from the MA/RI WEA. Through the Vineyard Wind NEPA process, BOEM acknowledged that the RODA transit lane alternative (Alternative F), "could further erode project economics and viability," (Mayflower Wind, 2020). If the RODA transit lanes were imposed, SouthCoast Wind would specifically lose 38 WTG/OSP positions under the 2 nm wide transit lane layout and 68 WTG/OSP positions under the 4-nm-wide transit lane layout.

SouthCoast Wind also considered optimized site layout plans. One layout would place OSP(s) in aligned rows or columns, but not on the 1 nm x 1 nm (1.9 km x 1.9 km) grid. Another considered optimized site layout was a grid with less than a 1 nm x 1 nm (1.9 km x 1.9 km) spacing between structures. These layouts were not selected for two primary reasons: (1) the USCG concluded that a standard and uniform grid layout maximizes safe navigation, and (2) collaboration among MA/RI WEA leaseholders concerning uniform layout and consistent lighting and marking of structures is paramount to assuring safe navigation.

2.1.2.1 Site Layout Selected for PDE

SouthCoast Wind worked with the USCG, BOEM, the other MA/RI WEA leaseholders, and other regulators and stakeholders to develop an aligned 1 nm x 1 nm (1.9 km x 1.9 km) grid for WTG/OSPs layouts across all MA/RI WEA leases. This collaborative layout provides both uniform spacing and 1 nm wide corridors in both the north-south and east-west orientations (Equinor Wind US, Eversource Energy, Mayflower Wind, Orsted North America, and Vineyard Wind LLC, 2019) across all of the MA/RI WEA lease areas. Further, the USCG stated in its MARIPARS report that it:

> "strongly recommends that BOEM require a standard array throughout the MA/RI WEA that would allow for multiple, straight-line navigation safety corridors through the MA/RI WEA. A standard and uniform grid pattern for offshore structures with multiple straight orientations throughout the MA/RI WEA would maximize safe navigation within the MA/RI WEA." (USCG, 2020).

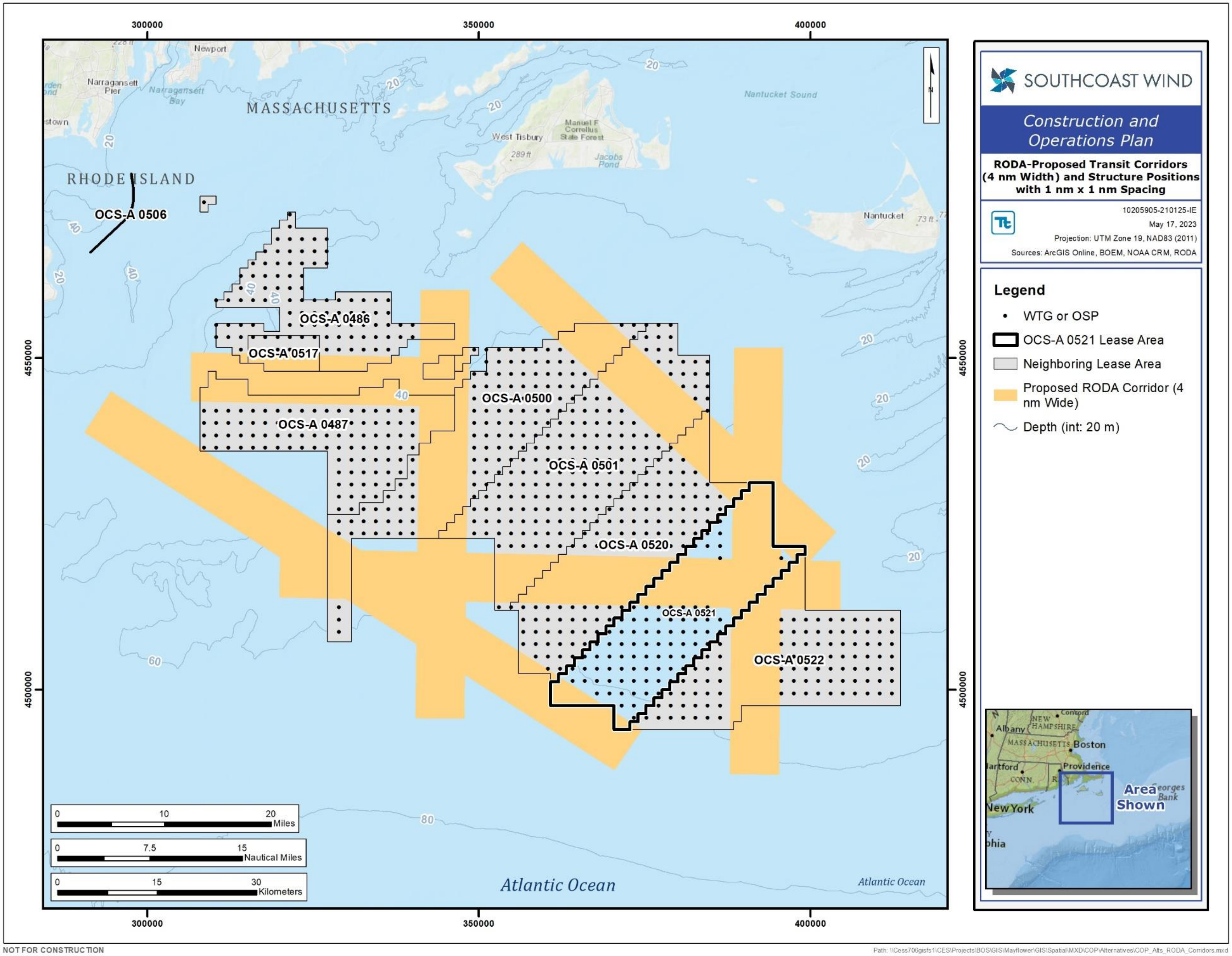

FIGURE 2-1. RODA-PROPOSED FISHING CORRIDORS (4 NM WIDTH) AND STRUCTURE POSITIONS WITH 1 NM X 1 NM (1.9 KM X 1.9 KM) SPACING

After consideration, SouthCoast Wind is moving forward with the agreed upon 1 nm x 1 nm (1.9 km x 1.9 km) grid layout (see Section 3.3, Project Components and Project Stages).

2.1.3 Substructures

Selecting the appropriate substructures for a project requires careful consideration of conditions present at the site and the construction feasibility of considered designs.

A floating foundation system is a buoyant platform for WTGs or OSPs that connects to the seabed using mooring cables and anchors. Three types of floating foundation systems currently exist, including spar buoy, semi-submersible, and tension leg platform. A spar buoy uses a ballast installed very low underneath its main buoyancy tank to create stability. Semi-submersibles cover a wide footprint on top of the water with multiple buoyancy tanks, causing more of its structure to be above the waterline. A tension leg platform uses the mooring line tension between the submerged buoyancy tank and anchors to create stability. This is a rapidly developing technology used primarily in water depths over 196.8 ft (60.0 m) (NREL, 2020).

Floating foundation systems inherently have significantly different considerations when compared to the fixed bottom structures proposed in the PDE. Since the majority of the Lease Area resides in waters shallower than 196.8 feet (60.0 m), fixed bottom has been identified as the preferred solution. Any floating alternative that could be seen as beneficial in a research and development capacity, or otherwise, would be addressed at a later date, in a separate permitting process.

Gravity-based structure (GBS) foundations are a fixed foundation type typically constructed of steel, concrete, or a combination, and sit on top of the sea floor so they are not pile driven. These structures have sufficient mass and diameter to provide the stability and stiffness required to resist overturning loads and are suitable for either WTGs or OSPs. Site preparation is a critical element of the overall construction and installation of GBS foundations.

GBS foundations require more seabed preparation than other foundation types, resulting in the greatest potential impacts to benthic communities of the substructure options previously presented by SouthCoast Wind. This is because the installation site for GBS substructures must be flat and level, which is often achieved by leveling the seabed by dredging bottom material in preparation for foundation placement. Dredging creates a depression or pit in the seafloor. The site may be dredged several meters below the mudline to remove weak soils or provide additional resistance through embedment. In addition, a gravel pad may be built up on the seabed to provide a uniform foundation before positioning the base. Sediment deposition can also occur during installation if dredged materials from bottom preparation are discharged into the water column or directly onto the seafloor. GBS would lead to significantly more benthic habitat loss compared to monopile/piled jacket foundations.

Additionally, the difference in cost for GBS is up to 70 percent higher than traditional steel foundations. The primary driver of the increase in cost is due to the extensive materials and fabrication cost required to deliver the foundations.

In addition, geotechnical variability in the upper soil layers makes several locations unsuitable for GBS foundations. It would require significant dredging and seabed preparation for the GBS to be installed at these locations, which would impact benthic habitat.

Although GBS foundations were seriously considered for use by the Project, and included in the initial COP PDE, due to the technical, economic, and ecological challenges and greater impact levels associated with GBS substructures described above, SouthCoast Wind has removed GBS foundations from the COP PDE.

2.1.3.1 Substructures Selected for PDE

SouthCoast Wind has selected three viable substructure options, described further in Section 3.3.1, to potentially be used in the proposed Project. These include:

- Monopiles,
- Piled jackets, and
- Suction-bucket jackets

2.1.4 Offshore Substation Platforms

The OSP is where Project-generated power is stepped up from the inter-array cable voltage to the export cable voltage. OSPs require a robust design and can include multiple decks for equipment. SouthCoast Wind originally considered a large range of platform sizes, number of OSPs, pile depths, and scour protection options. Initial designs were filtered down based on conservative assumptions for environmental impacts and front-end engineering to rule out infeasible, unsafe, or overly impactful options.

2.1.4.1 Offshore Substation Platform Designs Selected for PDE

The proposed Project's OSP PDE will include the following designs, which are described further in Section 3.3.3:

- Modular OSP,
- Integrated OSP, and
- DC Converter OSP.

2.1.5 Inter-Array Cables

Submarine inter-array cables will connect the WTGs to the OSPs. SouthCoast Wind will consider multiple inter-array cable layouts within the Lease Area and attempt to optimize the proposed Project by minimizing cable lengths and maximizing efficiency and reliability. Thus, only indicative layouts have been selected at this time.

Considerations for inter-array cables may include offshore physical hazards and economic or recreational use areas. Physical hazards may include shipwrecks, unexploded ordnance (UXO), other existing cables, and sea floor and subsurface obstructions. Economic or recreational uses may include commercial or recreational fishing, recreational boating and tourism, and anchoring.

2.1.5.1 Inter-Array Cable Layouts Selected for PDE

SouthCoast Wind has presented two indicative inter-array cable layouts which may be used for the proposed Project. See Section 3.3.4 for more information regarding the proposed indicative inter-array cable layouts.

2.1.6 Offshore Export Cables

The offshore export cables will connect the OSPs to the landfall locations. Several alternative export cable corridors were considered. Transmitting energy from OSPs to the landfall location requires careful planning and route optimization with considerations including offshore physical hazards, economic or recreational use areas, protected areas, and POIs. Physical hazards may include shipwrecks, UXO, other existing cables, and sea floor and subsurface obstructions. Economic or recreational uses may include commercial or recreational fishing, recreational boating and tourism, and anchoring. Protected areas may include areas protected for biological, cultural, or historical purposes.

The proposed Project considered five export cable corridors from the Lease Area to Falmouth, Massachusetts, and three export cable corridors from the Lease Area to Brayton Point. The Falmouth export cable corridors considered mainly diverged paths near and through Muskeget Channel. Falmouth Alternative 1 through Alternative 4 export cable corridors, shown in **Figure 2-2**, are no longer feasible for the proposed Project as described below**.** Brayton Point Alternative 1 and Alternative 2 export cable corridors, shown in **Figure 2-2**, are no longer feasible for the proposed Project as described below.

Falmouth Alternative 1 was deselected because of its similarity to selected corridors, which provided the proposed Project with adequately differentiated options through Muskeget Channel and into Nantucket Sound.

Falmouth Alternatives 2 and 3 were deselected in order to avoid confliction with other proposed offshore wind projects and because of challenging seabed conditions within Muskeget Channel that were identified during reconnaissance and site characterization surveys completed in 2020. The resulting level of technical risk was too high to carry these corridors through for the PDE.

Falmouth Alternative 4 was deselected because of challenging seabed conditions that were identified in a desktop assessment, amounting to a high level of technical risk, especially near Muskeget Island and Nantucket. For Falmouth Alternatives 2 through 4, these challenging seabed conditions include expected high sediment mobility, very shallow bathymetry, and high seabed slopes.

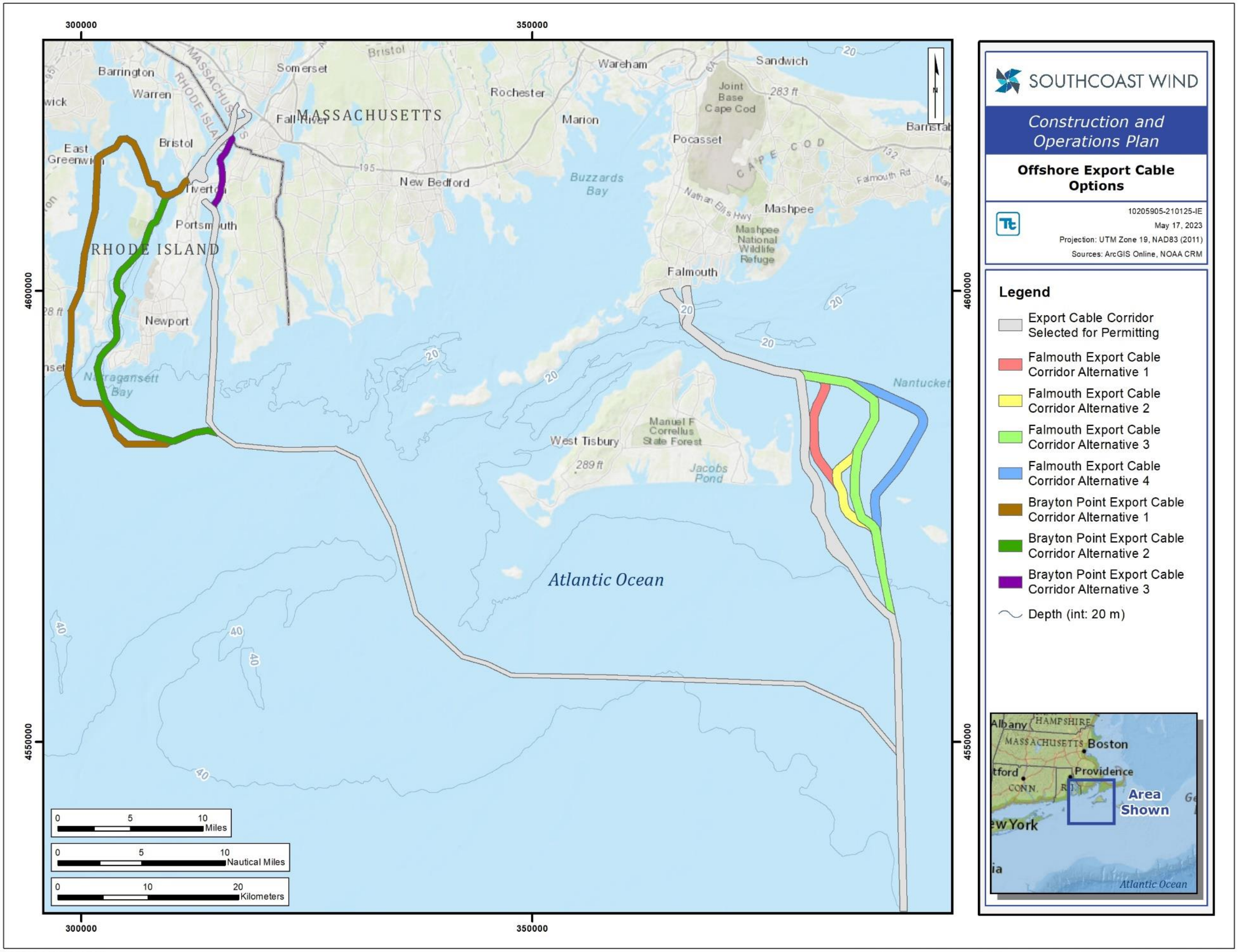

FIGURE 2-2. ALTERNATIVE EXPORT CABLE CORRIDOR OPTIONS (COLORED ROUTES)

Brayton Point Alternative 1 was deselected due to its longer route length (relative to the other routes) to Brayton Point, a potential conflict with the planned Revolution Wind export cable corridor within the proposed Rhode Island Coastal Resources Management Council (CRMC) Renewable Energy Corridor, the crossing of the federally maintained 40-ft (12-m) Channel to Providence, Rhode Island, challenging seabed conditions amounting to a high level of technical risk, and the potential for impacting other marine stakeholders.

Brayton Point Alternative 2 was deselected due to the potential for impacting other marine stakeholders, including the U.S. Navy, which has a significant presence within the waters surrounding Newport, Rhode Island (which would be traversed by this cable corridor), which are designated as Restricted Areas. Additionally, the area traversed by Brayton Point Alternative 2 is a commonly used navigational route to Rhode Island Sound and contains numerous charted anchorages.

Brayton Point Alternative 3 was deselected due to the technical complexity and potential marine stakeholder interactions of routing the cable through constrictions at the area of the Stone Bridge and Railroad Bridge in the northern Sakonnet River, and the need for crossing federally maintained navigation channels in Mount Hope Bay. Specifically, the highly constrained portion of the northern Sakonnet River is known to be an area of limited available seabed for routing, contains a heavily scoured seabed with rock and debris, and experiences significant transit and mooring by recreational vessels.

2.1.6.1 Offshore Export Cable Corridors Selected for PDE

Two export cable corridors have been selected for the PDE and are described in Section 3.3.5. The two corridors include one route to Falmouth, Massachusetts, the Falmouth export cable corridor, and one route to Brayton Point, the Brayton Point export cable corridor.

The selected Falmouth export cable corridor follows the westernmost route option through Muskeget Channel that was considered by the Project. The selected Brayton Point export cable corridor travels up the Sakonnet River and contains an intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, to avoid the constricted area near the Stone Bridge and Railroad Bridge located in the northern Sakonnet River. See Section 3.3.5 for further details on the Falmouth and Brayton Point export cable corridors selected for the PDE. Each export cable corridor includes variations at approach to landfall(s).

2.2 ONSHORE FACILITIES

Onshore facilities for the proposed Project include landfall locations, including the sea-to-shore transitions, onshore export cables, onshore substation and converter stations, underground transmission lines, and the utilities' POIs. SouthCoast Wind carefully considered several potential onshore components and sites for the proposed Project.

2.2.1 Landfall Location

The assessed landfall locations for the proposed Project are located in Falmouth and Somerset, Massachusetts and Portsmouth, Rhode Island. Many factors were considered and weighed when choosing or excluding a landfall location.

Physical space availability was evaluated primarily for construction and installation. SouthCoast Wind assessed land use adjacent to potential landfall locations to understand environmental impacts, potential for use of existing infrastructure, and areas with historic and conservation districts or businesses that could be impacted including nearby marine users (i.e., fisheries).

Water depth at the landfall approach was also an important factor. Horizontal directional drilling (HDD) punchout locations, where the offshore export cables will begin the approach to shore, are likely to be on the order of 16.4 to 26.3 feet (5.0 to 8.0 m) in depth for Falmouth HDD locations and 6.6 to 32.8 feet (2.0 to 10.0 m) for Brayton Point (including intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island) HDD locations. The selected location needs to balance avoidance of submerged aquatic vegetation, risk of cable exposure due to wave action, and complexity of sea-to-shore HDD operations.

A landfall location at Elm Road in Falmouth, Massachusetts was considered in early stages of the proposed Project's onshore evaluation but has since been excluded. Elm Road is west of the Mill Road landfall location, as shown in **Figure 2-3.** Elm Road intersects Surf Drive at Falmouth's southern shoreline, then continues for 1.0 mile (1.6 km) north/northwest. At its southern end, Oyster Pond flanks it on the west side and Salt Pond flanks it on the east side. The close proximity to both environmentally sensitive wetlands factored into the exclusion of this landfall location. Additionally, this location does not have any large areas for installation vehicles and equipment and thus, installation operations may have posed a risk to the nearby wetlands. Finally, the Elm Road landfall location would have involved a number of offshore cable crossings. Use of HDD for the crossings would also be technically challenging and may pose a risk to existing utility infrastructure due to existing subsea utility cables.

A landfall location at Mill Road in Falmouth, Massachusetts was also considered. SouthCoast Wind evaluated the suitability of a parking lot at the juncture of Mill Road and Surf Drive for the siting of HDD entry pits and cable transition vaults. The Project was made aware of an existing utility cable landfall and transition vault system in this parking lot, which would introduce significant challenges for siting SouthCoast Wind's system and routing cables inland. This location was deselected as a result of these findings.

A landfall location at Kite Park (also known as Hotel Park) on Grand Avenue in Falmouth, Massachusetts was evaluated in response to feedback from Town of Falmouth officials, who requested that SouthCoast Wind consider its feasibility. Kite Park is a large, open public park owned by the Town of Falmouth, located approximately 0.35 mile (0.6 km) to the west of the Central Park Landfall. Kite Park is surrounded by residential areas to the north, east, and west. South of the Park, across Grand Avenue, it is flanked by privately-owned beach parcels, and one Town-owned beach parcel to the southwest. Kite Park is not carried forward in the PDE at this time due to commercial challenges securing the landfall location. Kite Park is also more technically challenging compared to the selected landfall locations described in Section 2.2.1.1.

2.2.1.1 Landfall Locations Selected for PDE

Three locations in Falmouth, Massachusetts are considered feasible landfall locations for the proposed Project to Falmouth: 1) Worcester Avenue (preferred); 2) Central Park (alternate); and 3) Shore Street (alternate). See Section 3.3.6 for more information.

Two locations at Brayton Point in Somerset, Massachusetts are considered feasible landfall locations for the proposed Project to Brayton Point, one of which approaches the site from the west (near the Lee River, the Western landfall), and the second of which approaches the site from the east (near the Taunton River, the Eastern landfall). Additionally, there are multiple feasible landfall locations still under consideration for the portion of the export cable route to Brayton Point, which will involve an intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island.

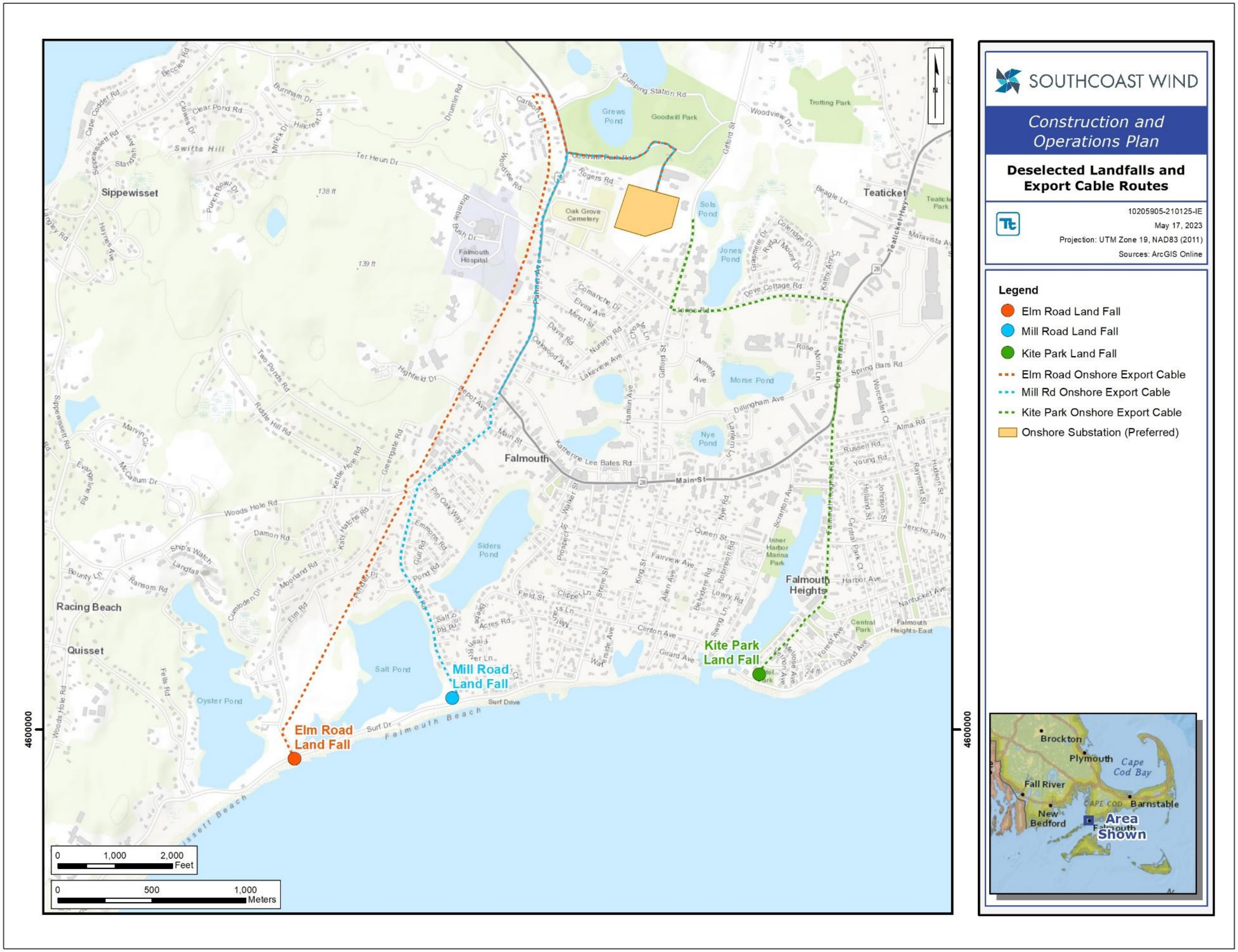

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FIGURE 2-3. ELM ROAD LANDFALL LOCATION AND THE BIKE PATH ONSHORE EXPORT CABLE ROUTE (DESELECTED)

2.2.2 Sea-to-Shore Transition

SouthCoast Wind considered two techniques to bring the export cables ashore: HDD and open-cut trenching. The proposed HDD activities are discussed in Section 3.3.6. Potential environmental impacts were the primary factor in SouthCoast Wind's analysis of the export cable transition installation. Open-cut trenching would involve excavating the export cable's proposed sea-to-shore transition to the desired depth, placing the cable inside this newly created trench, and refilling the trench to the appropriate level. This option was deselected because of the added, undue risk of potential impacts to nearshore resources, including tidal zones, eelgrass zones, public beaches, and coastal dune areas.

2.2.2.1 Sea-to-Shore Transition Selected for PDE

HDD will enable cable installation to pass beneath the nearshore area, tidal zone, eelgrass zone, beach, and adjoining coastal dune areas while minimizing impact to these marine resources. Thus, SouthCoast Wind has chosen to use an HDD methodology to bring the offshore export cables to the transition vault onshore, as described in Section 3.3.6.

2.2.3 Onshore Export Cable Route

SouthCoast Wind assessed various options for the underground onshore export cable route planned from the landfall locations to the new onshore substation and converter station sites. Factors considered while determining a route's feasibility include construction constraints, length of route, traffic congestion, and land use along potential routes. Environmental impacts and impacts to human activity were carefully assessed in the selection process.

The following discussion of onshore export cables is focused on the alternatives evaluated from landfall sites in Falmouth, Massachusetts to the onshore substation sites under consideration. The Brayton Point site benefits from minimal onshore cabling needs due to the close proximity of the new HVDC converter station sites to the landfall locations. Additionally, as land use and ownership and general environmental conditions are similar across the site (i.e., private ownership, minimal use constraints, industrial property), there is limited need, or possibility, for significant variation in onshore cable routes at Brayton Point. As discussed in Section 2.2.3.1, SouthCoast Wind has carried forward two routes to bring the cables from landfall to the new HVDC converter stations. The Elm Street/bike path route begins at a landfall location on Elm Street and continues to the proposed onshore substation site, as depicted in **Figure 2-3**. This route is the longest route from a landfall location to the onshore substation site. Portions of the bike path can be heavily trafficked, even during non-peak seasons. Closing a bike path could potentially create bike congestion on main roads, creating unnecessary driving and biking hazards. Construction along the bike path would also be challenging. While there would likely be fewer existing underground utilities, the bike path is narrower than a public road, bordered by environmentally sensitive areas in several locations, and construction equipment access would be difficult to maintain without potentially substantial environmental impacts. Finally, there is an existing cable transition vault at the Elm Street onshore landfall location. For these reasons, the Elm Street/bike path route was eliminated from further consideration.

The Mill Road route begins at a landfall location on Mill Road and Surf Drive and continues to the proposed onshore substation site, as depicted in **Figure 2-3**. This route is the second longest route from a landfall location to the onshore substation site. As described in Section 2.2.1, there is an existing cable transition vault in the northeast corner of the Mill Road parking lot. Navigating SouthCoast Wind's onshore cables around that system and onto Mill Road would be challenging. Mill Road is closely flanked by Salt Pond to the west, with little vertical separation between the road and the water, which could introduce challenges during construction. For these reasons, the Mill Road route was eliminated from further consideration.

2.2.3.1 Onshore Export Cable Routes Selected for PDE

The Falmouth onshore export cable routes chosen for PDE inclusion will connect the landfall locations at Worcester Avenue, Central Park, and/or Shore Street to one of the two viable onshore substation sites.

The Brayton Point onshore export cable route chosen for PDE inclusion (preferred) is the western access route via the Lee River as it is the most direct route offshore, avoiding other cables and dredged channels. An additional route onshore route from a landfall on the eastern side of Brayton Point from the Taunton River, is also considered as an alternate.

See Section 3.3.7 for more details pertaining to the potential onshore export cable routes.

2.2.4 Onshore Substation

If utilized under the Falmouth variant option, the new, SouthCoast Wind-owned onshore substation in Falmouth, Massachusetts, will step up the underground transmission circuit to the ±345-kilovolt (kV) overhead transmission line. The converter stations in Somerset, Massachusetts will convert the buried offshore export input ±320-kV DC cable input to a standard 345-kV. The onshore substation and converter stations ideally would be sized appropriately for construction, optimal layout, and safe operation. Location is an important consideration for these components, as it affects the length and route of the onshore export cable route, and its corresponding potential environmental impacts.

SouthCoast Wind worked with local contractors to evaluate onshore locations in both Falmouth and Somerset, Massachusetts, initially based on land availability and proximity to potential landfall locations. Subsequently, SouthCoast Wind ruled out locations with greater environmental impacts. Out of the ten onshore substation sites initially considered, eight were excluded from future planning. Some of the rejected substation sites were too small to house all of the necessary equipment for the preferred onshore substation configuration. Other sites were not chosen due to unnecessary environmental/social impacts which were apparent, such as required tree clearing, wetland and watershed resource disruption, or close proximity to residential neighborhoods.

SouthCoast Wind deselected a potential substation site located on Joint Base Cape Cod due to the shift in the POI location from Bourne, Massachusetts to Falmouth, Massachusetts, as described in Section 2.2.6. Another potential substation site at the Falmouth Yard Waste and Composting facility was deselected because substantial tree clearing would be required, and the substation infrastructure would be very close to neighboring residents (**Figure 2-4**).

For Brayton Point, SouthCoast Wind deselected a substation site in Fall River as the Brayton Point converter site is immediately adjacent to the Brayton Point POI. This avoids the need for alternating-current (AC) cabling across the Taunton River and the construction of converter stations in a dense, dual commercial/residential area in Fall River. The Brayton Point site's available land, previous use as a coal plant, and overall suitability contrasts greatly from other alternatives that would require longer onshore cable routes, greater terrestrial impact, and/or a greenfield site.

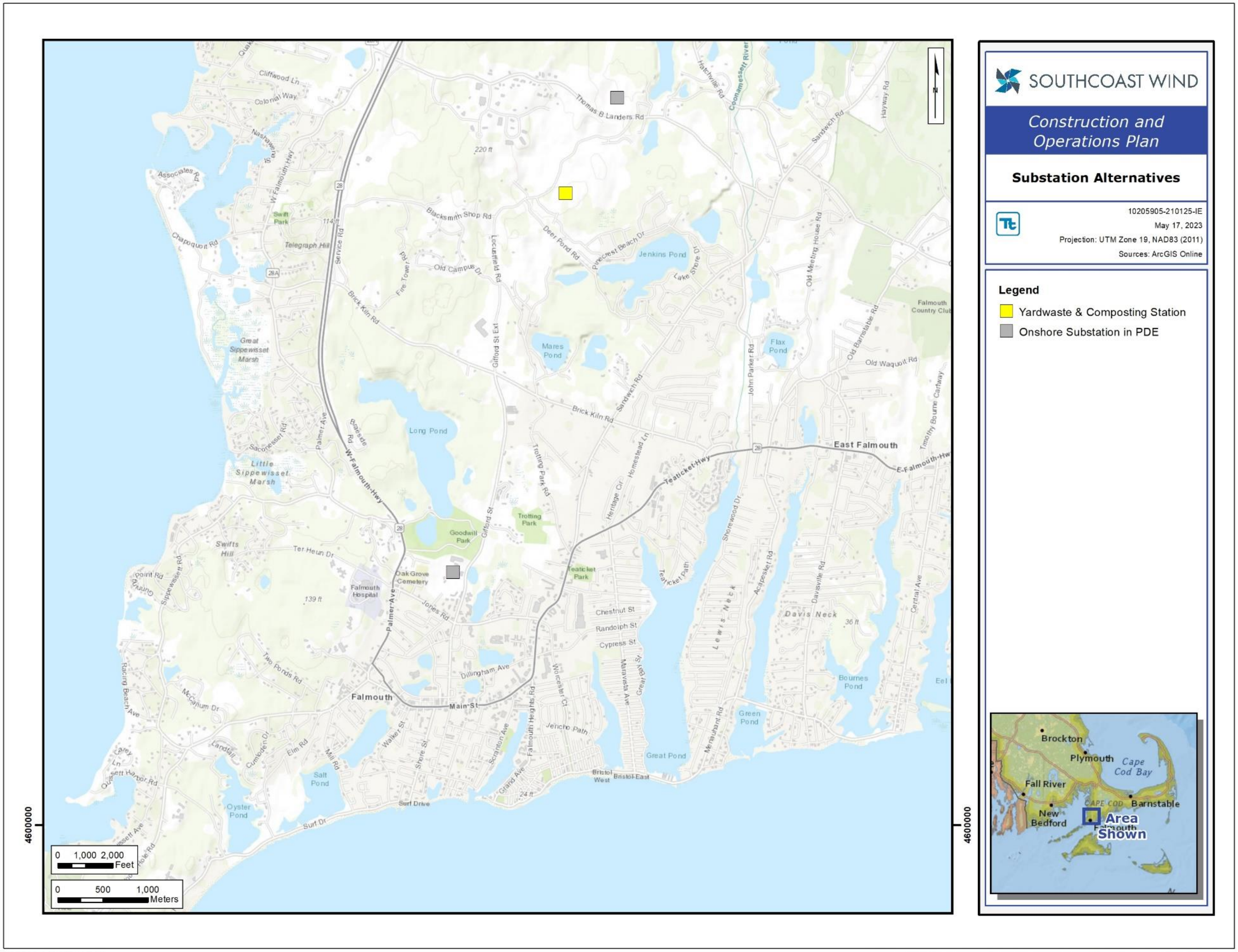

FIGURE 2-4. FALMOUTH ONSHORE SUBSTATION ALTERNATIVES

2.2.4.1 *Onshore Substation Sites Selected for PDE*

Two viable onshore substation locations are under consideration for the proposed Project in Falmouth: 1) Lawrence Lynch (preferred); and 2) Cape Cod Aggregates (alternate). Two viable onshore converter station locations are under consideration for the proposed Project at Brayton Point. See Section 3.3.8 for more information pertaining to the onshore substation and converter station sites.

2.2.5 345-kV Overhead or Underground Transmission Line

There are a number of considerations in planning an overhead transmission line, including engineering factors (total length, number of road and railroad crossings, etc.), environmental factors (nearby wetlands, croplands, conservation areas, etc.), and social factors (nearby residential or commercial areas, public facilities, historic areas, visual effects, etc.). Considerations for planning an underground transmission route are similar to those presented in Section 2.2.3, and include construction constraints, length of route, traffic congestion, and land use along potential routes. Environmental impacts and impacts to human activity were carefully assessed in the selection process.

2.2.5.1 *Transmission Lines Selected for PDE*

Under the preferred option for Falmouth, if Falmouth is the selected POI for Project 2, SouthCoast Wind has assumed that Eversource Energy (Eversource) will be responsible for designing, permitting, constructing, and operating the overhead transmission line within Eversource right-of-way (ROW) #341 that will connect the proposed onshore substation to the Falmouth Tap POI (see Section 2.2.6). Accordingly, impacts related to the construction of the overhead line from the Lawrence Lynch substation to Falmouth Tap are not included herein. The Project is also considering an underground transmission line option, which will follow previously disturbed roads and pathways, and which will connect the onshore substation to the POI in Falmouth, Massachusetts. Both transmission line options are included in the PDE; see Sections 3.3.9 and 3.3.10 for more information. Under the preferred Brayton Point site option, the Project will consist of underground transmission lines for both the HVDC input and HVAC output to the POI. Underground transmission lines at Brayton Point will be installed at industrial site of the former Brayton Point Power Station. See Section 3.3.9, Underground Transmission Route, for more information.

2.2.6 Switching Station/Point of Interconnection

At the POI, the 345-kV transmission line will connect to the electrical grid. Factors contributing to the selection or deselection of a location for a POI or switching station include the potential landfall location, overall impact of cabling to the POI, and grid stability.

SouthCoast Wind conducted a high-level assessment of a POI at West Barnstable, Massachusetts, but this location is less desirable. The 345-kV West Barnstable POI is located in Hyannis, Massachusetts and is approximately 18.0 miles (29.0 km) away from the proposed Project's closest landfall location at Worcester Avenue. The onshore export cable route was significantly longer than other available options, creating a volume of avoidable onshore construction and environmental impacts from the proposed Project's landfall locations to the West Barnstable POI.

On October 21, 2020, ISO-New England Inc. (ISO-NE) announced the Notice of Initiation of the Cape Cod Resource Integration Study (Cape Cluster) otherwise known as a cluster study. The cluster study process is initiated when there are multiple projects proposing to interconnect in the same electrical area of the transmission system and cannot interconnect without the use of common, significant new transmission line infrastructure rated at or above 115 kV AC or HVDC.

During the cluster study process, the grid operator ISO-NE can relocate a project's POI based on facilitating the interconnection of the projects in the cluster and meeting reliability requirements. Based on discussions with ISO-NE and the interconnecting transmission owner, SouthCoast Wind has deselected the switching station and POI in Bourne, Massachusetts (as set forth in SouthCoast Wind's original interconnection request) for a POI in Falmouth Massachusetts (**Figure 2-5**). The location of the new Falmouth POI is expected to be adjacent to existing electrical infrastructure located at the Falmouth Tap substation.

In the event that the Falmouth variant is utilized, and Falmouth is the selected POI for Project 2, Eversource will be responsible for designing, permitting, constructing, and operating the overhead transmission line within Eversource ROW #341 that will connect the proposed onshore substation to the Falmouth Tap POI. Accordingly, impacts related to the construction of the overhead line from the Lawrence Lynch substation to Falmouth Tap are not included herein. Additionally, the required upgrades to facilitate the relocation of the POI would be managed through the interconnection cluster process, the regional transmission system operator, and the interconnecting transmission owner. A change in POI as contemplated by ISO-NE would be within the PDE of the proposed route and not require additional information or analysis.

SouthCoast Wind has chosen the Brayton Point POI as a preferred injection point as it offers significant injection capacity and multiple positive attributes for interconnection. The Brayton Point POI is modern, has an available 345-kV breaker bay (now surplus to the previous coal plant input) and direct (or closely proximate) access from both the landfall locations under consideration and the new HVDC converter station sites.

2.2.6.1 Point of Interconnection Selected for PDE

SouthCoast Wind's PDE will include a POI at the Falmouth Tap substation in Falmouth, Massachusetts (Falmouth variant), and a POI at the National Grid substation at Brayton Point in Somerset, Massachusetts (preferred), as detailed in Section 3.3.10.

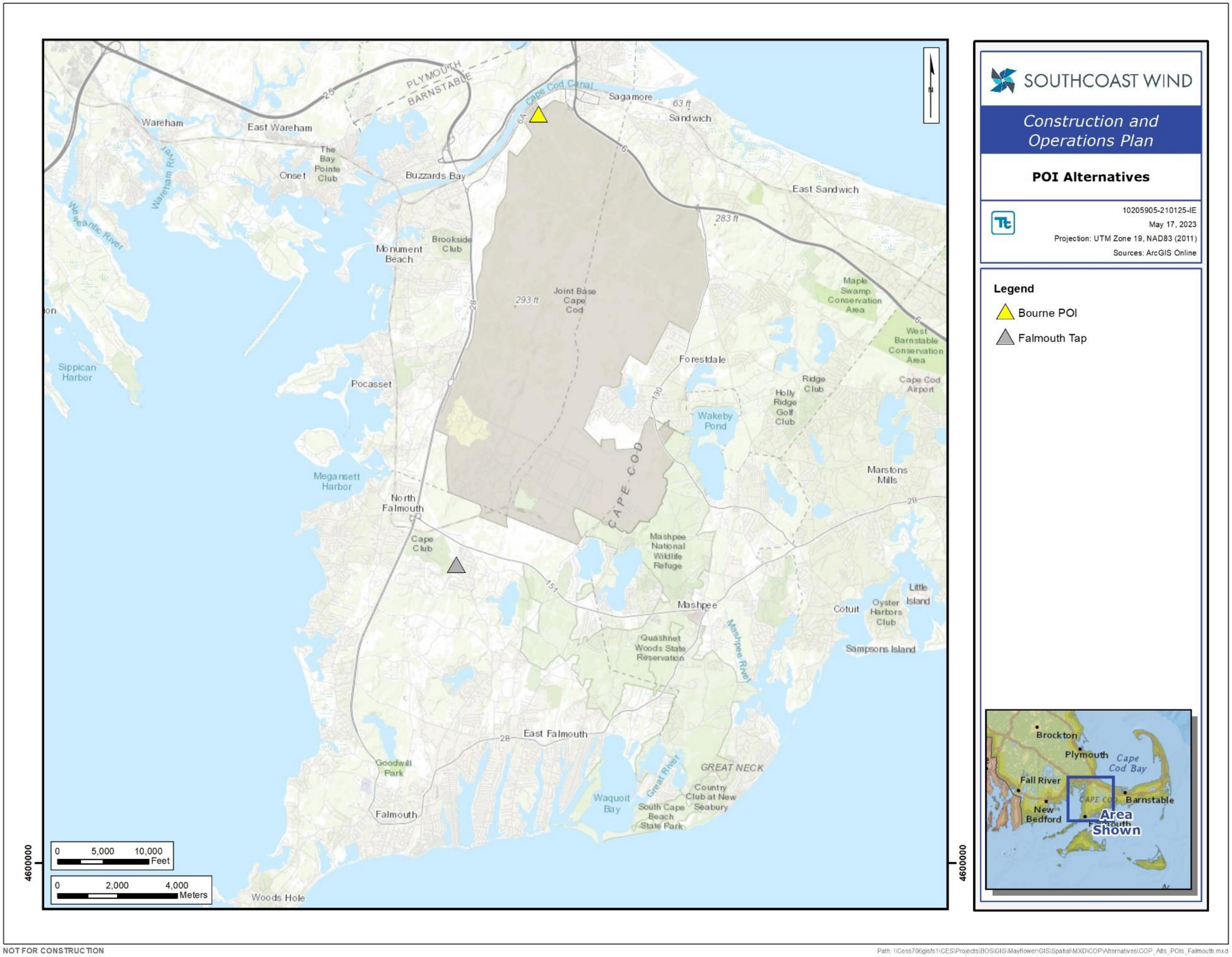

FIGURE 2-5. POINT OF INTERCONNECTION ALTERNATIVES FOR THE FALMOUTH EXPORT CABLE CORRIDOR

3 DESCRIPTION OF PROPOSED ACTIVITIES

3.1 PROPOSED PROJECT LOCATION

The Lease Area is located off the southern coast of Massachusetts, approximately 26 nm (48 km) south of Martha's Vineyard and 20 nm (37 km) south of Nantucket. At its closest point, the Lease Area is 39 nm (72 km) south from the mainland at Nobska Point in Falmouth, Massachusetts. The Lease Area, shown in **Figure 3-1**, is 127,388 ac (51,552 ha). There will be up to 149 positions in the Lease Area to be occupied by WTGs and OSPs. The 149 positions will conform to a 1 nm x 1 nm grid (1.9 km x 1.9 km) layout with an east-west and north-south orientation, as agreed upon across the entire MA/RI WEA leaseholders (Equinor Wind US, Eversource Energy, Mayflower Wind, Orsted North America, and Vineyard Wind LLC, 2019). As summarized in **Table 3-1** in Section 3.3, the 149 positions will be occupied by up to 147 WTGs and up to 5 OSPs. WTGs and OSPs will be connected via inter-array cables within the Lease Area.

The water depths, in relation to Mean Lower Low Water (MLLW), within the Lease Area range from 121.7 ft (37.1 m) to 208.3 ft (63.5 m), with deeper waters in the southwestern portion. The average depth is 164.0 ft (50.0 m). The WTG/OSP positioned at AQ35, located at latitude 40.602469 and longitude -70.51783, will occupy the deepest position in the Lease Area, placed at a depth of 206.7 ft (63.0 m), as depicted in **Figure 3-2.**

Within the Brayton Point export cable corridor, up to six submarine offshore export cables, including up to four power cables and up to two dedicated communications cables, will be installed. The cables will be installed in up to two cable bundles, each consisting of two power cables and one dedicated communications cable, where practicable. The cables will start at one or more OSPs within the Lease Area in federal waters, run west to Rhode Island waters and north up the Sakonnet River. They will make intermediate landfall and cross Aquidneck Island to Mount Hope Bay, then run north to Brayton Point in Somerset, Massachusetts. Multiple landfall sites are under consideration for the intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island (see **Figure 3-3**). Two landfall sites are under consideration at Brayton Point: the Western landfall from the Lee River and the Eastern landfall from the Taunton River.

Due to uncertainty around ISO-NE grid capacity and the extent and timing of necessary grid upgrades on Cape Cod, SouthCoast Wind's preferred POI for Project 2 is Brayton Point. In the event that technical, logistical, grid interconnection, or other unforeseen challenges arise during the design and engineering phase that prevent Project 2 from making interconnection at Brayton Point, Project 2 will make landfall and interconnect in Falmouth, Massachusetts, under the Falmouth variant scenario. Within the Falmouth export cable corridor, up to five submarine offshore export cables, including up to four power cables and up to one dedicated communications cable, may be installed from one or more OSPs within the Lease Area in federal waters and run through Muskeget Channel into Nantucket Sound in Massachusetts state waters, to make landfall in Falmouth, Massachusetts. The three landfall sites under consideration include coastal locations at the end of Worcester Avenue Central Park, and Shore Street.

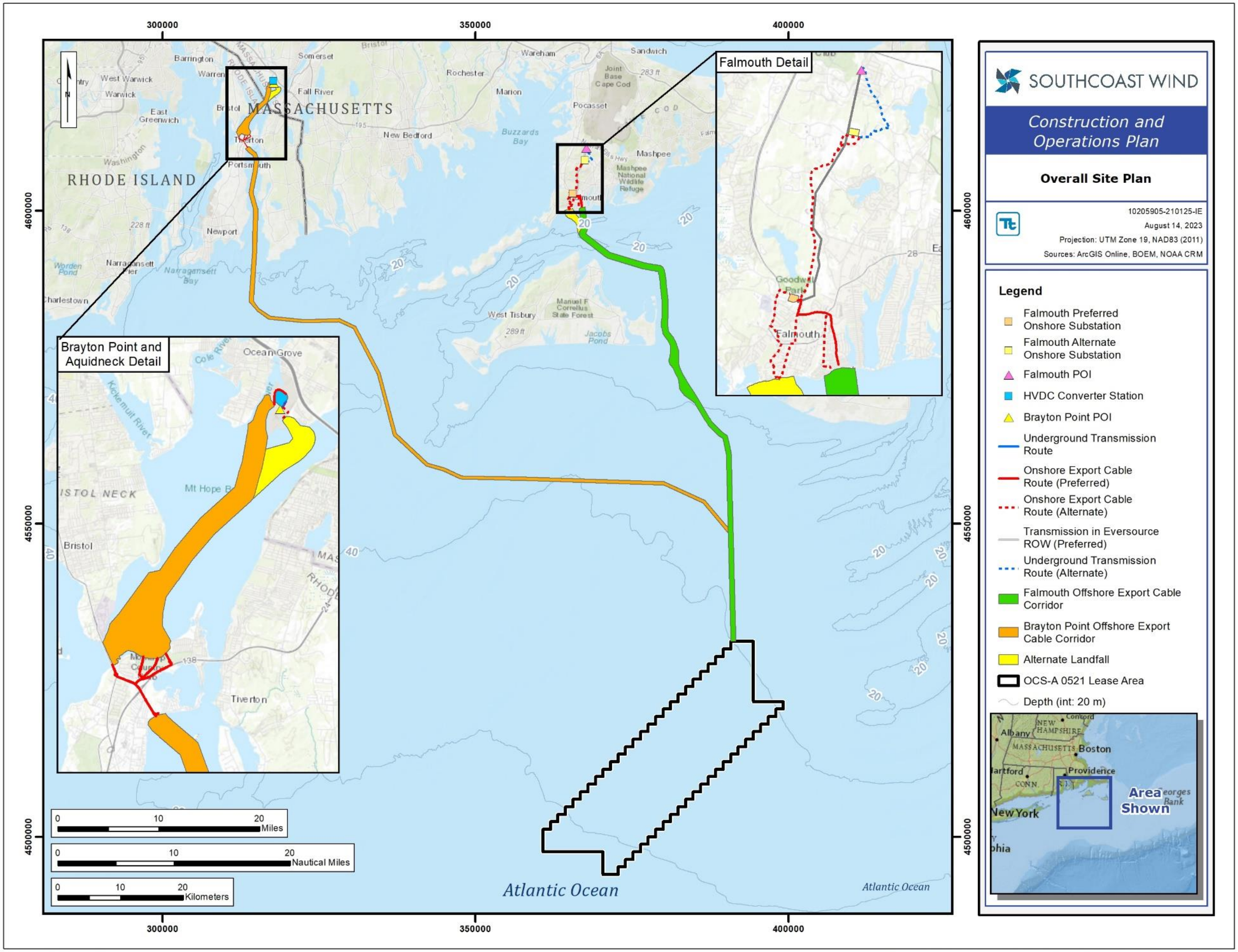

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FIGURE 3-1. OVERALL SITE PLAN FOR THE PROPOSED PROJECT

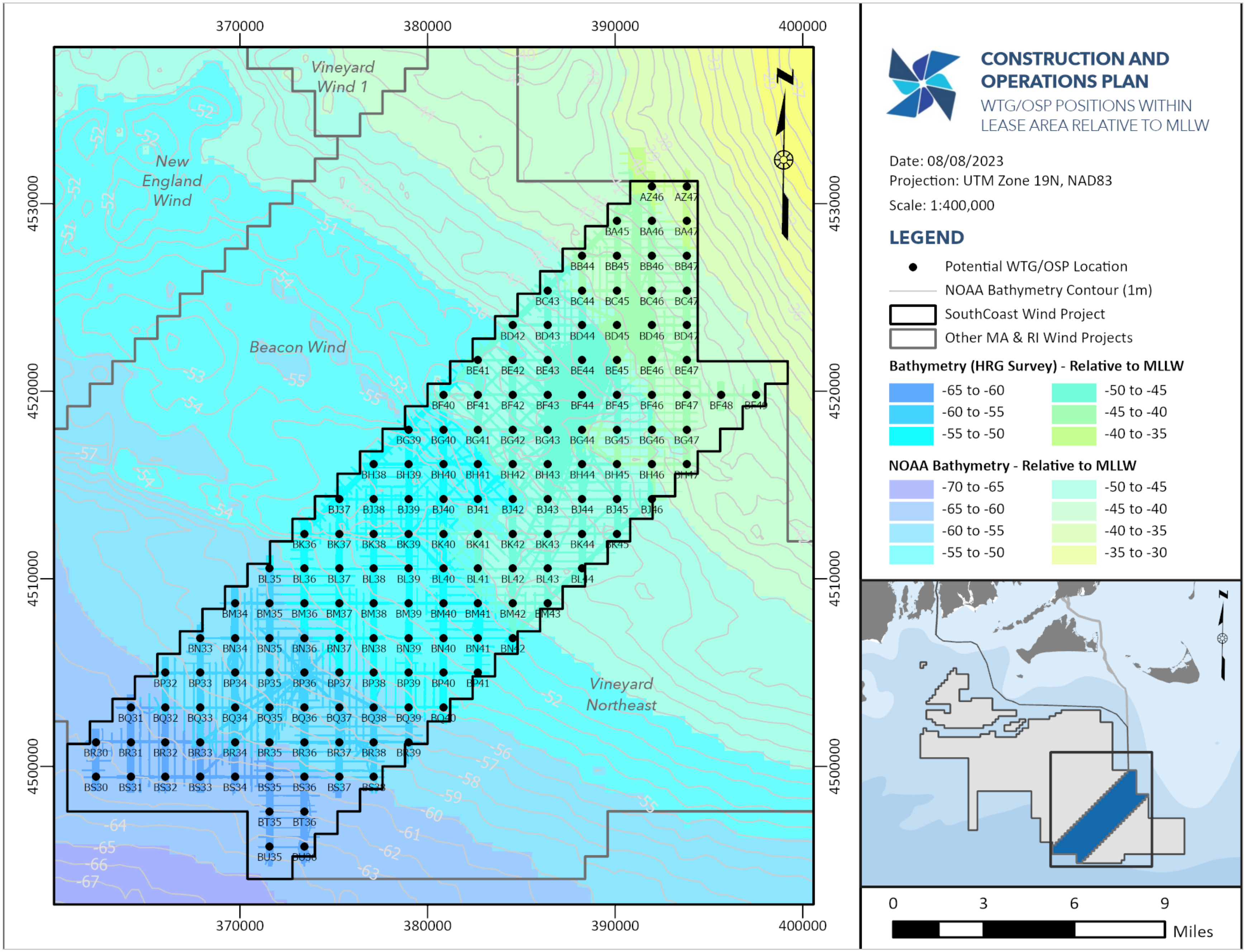

FIGURE 3-2. WTG/OSP POSITIONS IN THE LEASE AREA RELATIVE TO MLLW

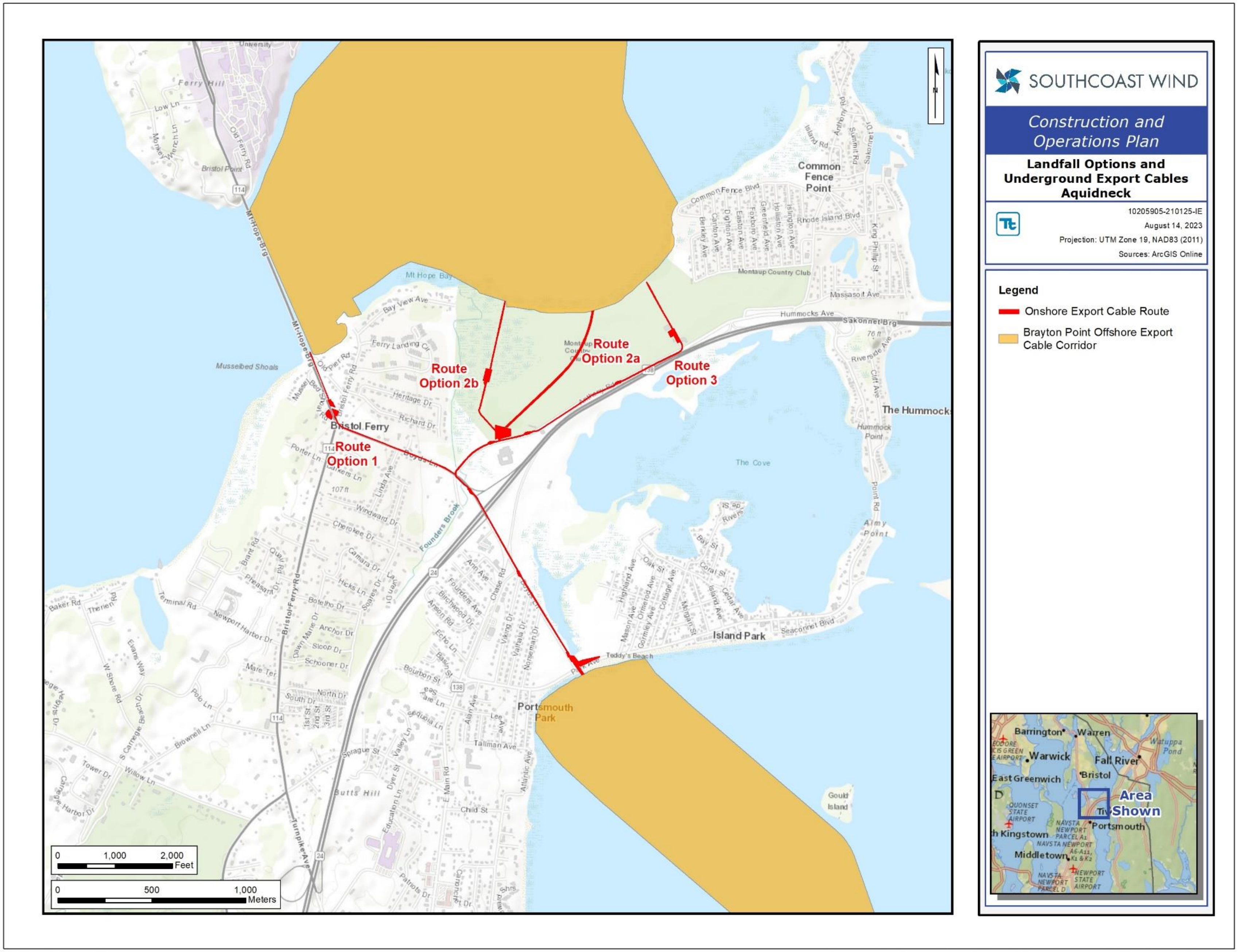

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FIGURE 3-3. ONSHORE FACILITIES FOR THE PROPOSED PROJECT–AQUIDNECK ISLAND

From the offshore export cable landfall sites in Falmouth, Massachusetts, up to 12 new underground onshore export power cables may transmit the Project's electric generation to a new, SouthCoast Wind-developed onshore substation. There are two onshore substation locations under consideration in Falmouth, Massachusetts, Lawrence Lynch and Cape Cod Aggregates. The onshore substation will transform the export cable voltage to 345 kV and contain equipment necessary to provide power quality conditioning and reactive power compensation to ensure that the proposed Project's connection meets the technical requirements administered by the federally designated local authority on such matters, ISO-NE.

If Falmouth is the selected POI for Project 2, the onshore substation will connect to the POI at Falmouth Tap in Falmouth, Massachusetts via an overhead transmission line in the transmission owner's right-of-way. Under this preferred scenario, the SouthCoast Wind Project will end at the onshore substation. Eversource Energy (Eversource) will be responsible for designing, permitting, constructing, and operating the overhead transmission line within Eversource ROW # 341 to the Falmouth POI. Accordingly, impacts related to the construction of the overhead line are not included herein. The Project is also considering an alternate underground transmission line option which will connect the onshore substation to the Falmouth POI. All onshore components for the proposed Project within the Falmouth Onshore Project Area are shown in **Figure 3-4.**

For the offshore export cable landfall sites at Brayton Point in Somerset, Massachusetts, up to four new underground onshore export power cables will transmit the Project's electric generation to up to two new, SouthCoast Wind-developed onshore HVDC converter stations. The onshore converter stations are specialized electrical substation designed to convert the HVDC power from the export cables to HVAC power to enable interconnection to the existing transmission infrastructure at the Brayton Point POI. The converter stations will contain equipment necessary to provide power quality conditioning to ensure that the proposed Project's connection meets the technical requirements administered by ISO-NE. New underground 345-kV transmission lines will be constructed entirely within the previously disturbed, industrial site at Brayton Point. The underground transmission lines will connect each converter station to the existing POI, the National Grid substation, at Brayton Point in Somerset, Massachusetts. All onshore components for the proposed Project at Brayton Point in Somerset, Massachusetts are shown in **Figure 3-5**.

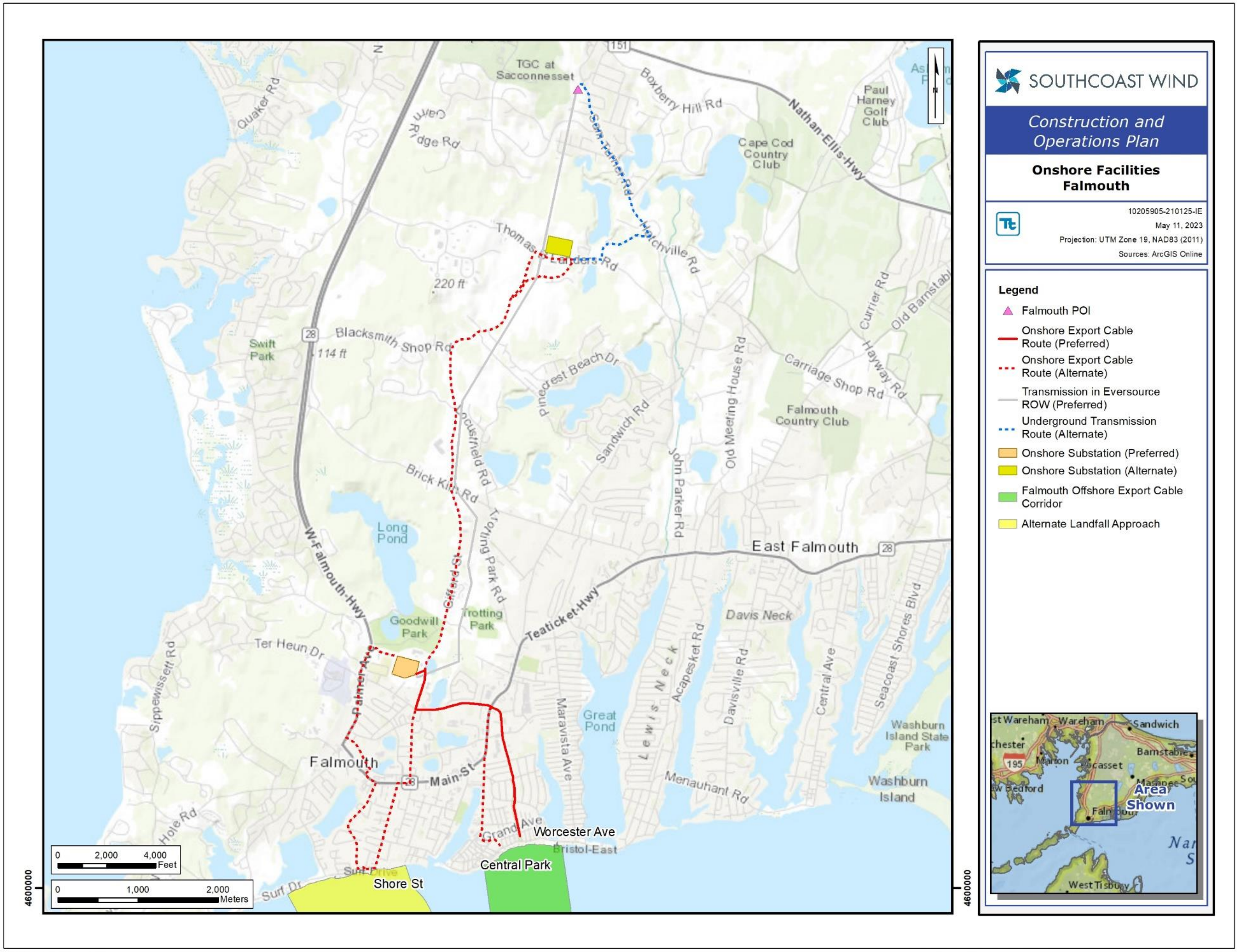

FIGURE 3-4. ONSHORE FACILITIES FOR THE PROPOSED PROJECT—FALMOUTH

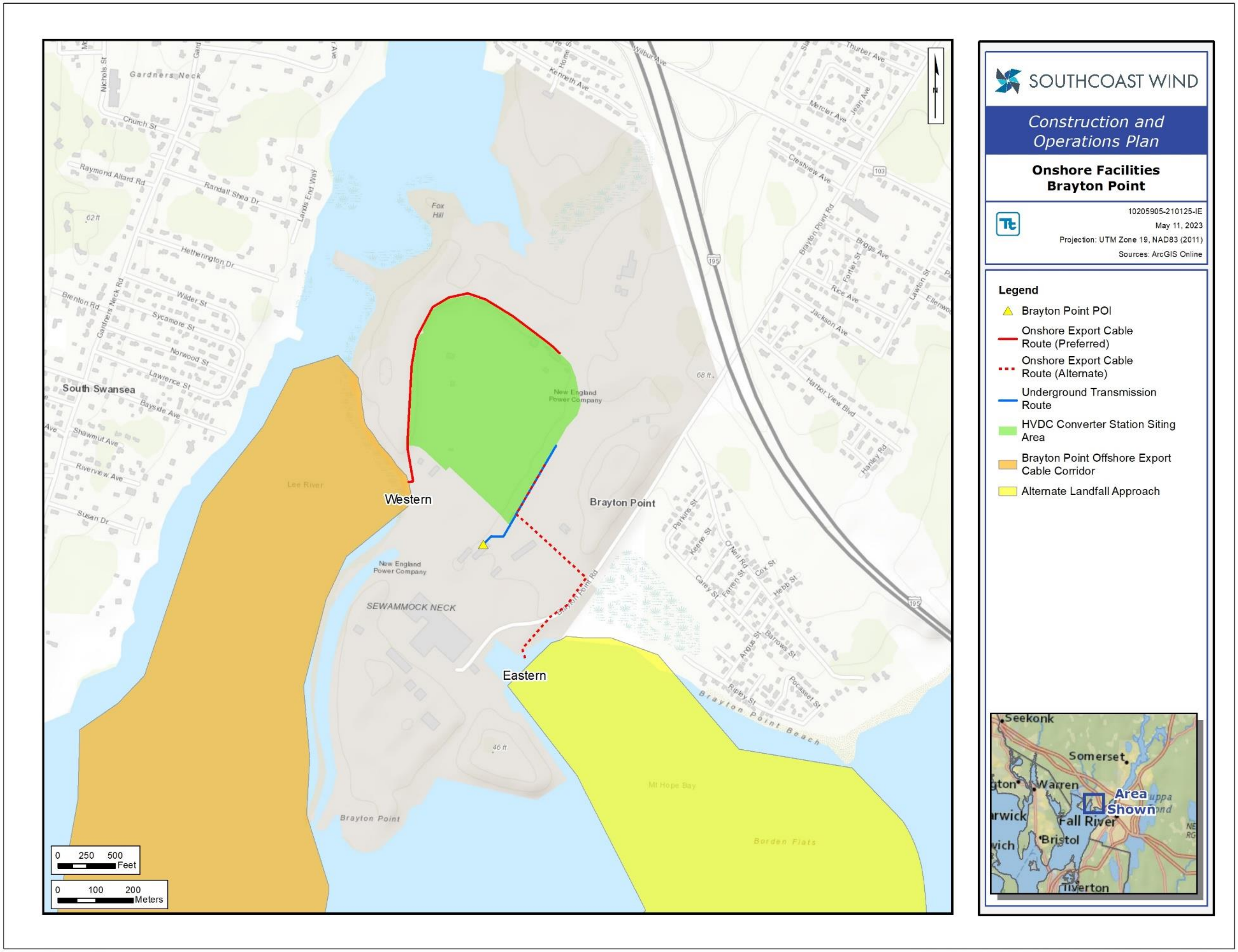

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FIGURE 3-5. ONSHORE FACILITIES FOR THE PROPOSED PROJECT—BRAYTON POINT

3.2 Proposed Project Schedule

Following the PDE guidelines set forth by BOEM'*s Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* (2020), SouthCoast Wind has selected a range of proposed Project components and activities to be included in this COP (see Section 3.3). As such, the construction schedule provided in **Figure 3-6** presents a baseline-case, with commentary that schedules may be moved year to year and timelines may be longer or shorter pending the selection of final technologies and installation methodologies, and receipt of all federal, state, and local permits.

SouthCoast Wind will acquire all necessary permits and authorizations before construction begins, which is anticipated in 2025. The selection and contracting of fabrication contractors, installation contractors, port facilities, and deployment vessels/vehicles for the proposed Project will be finalized prior to construction. Construction, inclusive of onshore and offshore site preparation, is expected to between three and six years. SouthCoast Wind's lease term for the operational phase is 33 years.[4]

Seabed preparations will be the first offshore activity to take place. This may involve scour protection installation, although scour protection may be placed either prior to or after OSP and WTG installation, depending on the requirements of each substructure type. Installation of substructures will be the next installation activity. Each substructure has different seabed preparation and installation timelines, as presented in Section 3.3.1.

The export cables and/or inter-array cables will be pulled into the OSPs and tested prior to energization. The OSP topsides could be installed immediately after the OSP foundations are installed or could be installed after the export cable and/or inter-array cables are pulled into the OSPs. Inter-array cable installation typically begins after the offshore export cable installation commences, but the order of installation will be finalized before construction commences. WTG installation and commissioning are expected to be the final offshore construction activities.

Onshore construction and installation activities will commence following receipt of appropriate permits and authorizations. The exact sequence of construction activities will be governed by the needs of the Project, but it is generally expected that many of the onshore construction activities will be conducted simultaneously.

Construction activities are presented in a sequence that could change based on installation methods, vessel and/or vehicle availability, and weather. Construction and operation and maintenance (O&M) activities and indicative schedules are provided in Sections 3.3.1 through 3.3.12.

[4] Extensions are permissible as indicated in 30 CFR 585.235 (a)(4).

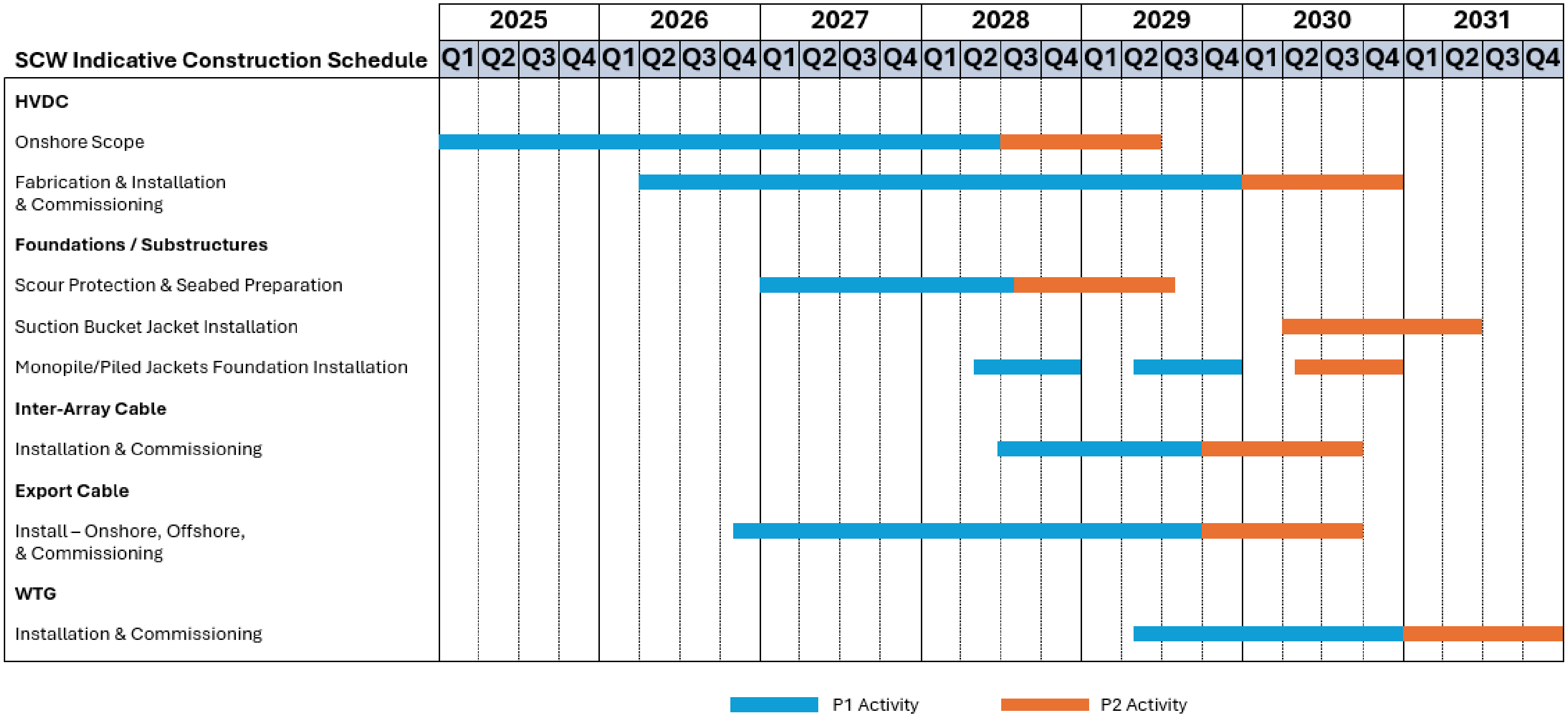


FIGURE 3-6. SOUTHCOAST WIND INDICATIVE CONSTRUCTION SCHEDULE

3.3 Project Components and Project Stages

Consistent with the PDE approach, SouthCoast Wind is considering a range of Project designs and construction techniques, which are described in this section. The PDE approach provides a flexible design during the permitting stage, based on maximum design scenarios and their associated potential impacts during construction, operation, and decommissioning. The PDE enables SouthCoast Wind to permit the proposed Project in anticipation of new technology and based on ongoing evaluation of site-specific conditions and supply chain discussions, which will optimize performance of Project components. The proposed Project will be constructed within the summarized PDE parameters set forth in **Table 3-1**, as well as described in corresponding subsections (BOEM, 2020).

SouthCoast Wind will conduct Project activities according to all relevant regulations and codes. BMPs will be implemented to minimize and mitigate potential impacts to the surrounding area and sensitive resources, and the season and hours of construction will be coordinated with local authorities. SouthCoast Wind will develop an onshore construction schedule to minimize effects to recreational uses and tourism-related activities to the extent feasible, such as scheduling nearshore construction activities to avoid the height of the summer tourist season. SouthCoast Wind will work and coordinate with stakeholders/visitors' bureaus to schedule outside of major events taking place onshore. For example, SouthCoast Wind does not anticipate HDD installation activities at the Falmouth landfall location between Memorial and Labor Day. SouthCoast Wind will complete all necessary surveys, assessments, and modelling before construction begins to ensure Project components are compatible with site-specific conditions.

SouthCoast Wind's construction and installation methods and O&M tasks and schedule are organized below by each Project component and described in Section 3.3.1 through Section 3.3.10. Major Project components include WTGs, OSPs, substructures, offshore export cables, inter-array cables, sea-to-shore transitions, onshore export cables, onshore substation, HVDC converter stations, underground transmission line, and POIs. SouthCoast Wind's general concept for operations and decommissioning is presented in Section 3.3.19 and 3.3.20 respectively.

TABLE 3-1. SOUTHCOAST WIND PROJECT DESIGN ENVELOPE SUMMARY

Component	Summary
Layout and Project Size	• Up to 149 WTG/OSP positions • Up to 147 WTGs • Up to 5 OSPs • 1 nm x 1 nm (1.9 km x 1.9 km) grid layout with east-west and north-south orientation
Substructures	• Monopile, piled jacket, and/or suction-bucket jacket structure (up to two different concepts will be installed; maximum 85 suction-bucket jacket for Project 2 only) • Seabed penetration: 0–262.5 ft (0–80.0 m) • Scour protection for up to all positions
WTGs	• Rotor diameter: 721.7–918.6 ft (220.0–280.0 m) • Blade length of 351.0–452.8 ft (107.0–138.0 m) • Hub height above MLLW: 418.7–605.1 ft (127.6–184.4 m)
OSPs	• Maximum structures envisaged located on grid positions: 5

Component	Summary
	• Top of topside height above MLLW: 160.8–344.5 ft (49.0–105.0 m) • Less than 10 million gallons per day (MGD) of once-through non-contact cooling water, with a maximum intake velocity of 0.5 feet per second (ft/s), with a maximum anticipated temperature change of 18°F (10°C) from ambient water, and a maximum end-of-pipe discharge temperature of 90°F (32.2°C) • Depth of withdrawal for cooling water ranging from approximately 25 to 115 ft (7.6 to 35.0 m) below the surface • Scour protection for all positions
Inter-Array Cables	• Nominal inter-array cable voltage: 60 kV to 72.5 kV • Length of inter-array cables beneath seafloor: 124.2–497.1 mi (200–800 km) • Target burial depth (below level seabed): 3.2–8.2 ft (1.0–2.5 m)
Falmouth Offshore Export Cables a/	• Number of offshore export cables: up to 5 • Anticipated nominal export cable voltage (AC or DC): 200–345 kV (AC) or ±525 kV (DC) • Length per export cable beneath seabed: 51.6–87.0 mi (83.0–140.0 km) • Cable/pipeline crossings: up to 9 • Target burial depth (below level seabed): 3.2–13.1 ft (1.0–4.0 m)
Brayton Point Offshore Export Cables	• Number of offshore export cables: up to 6 • Nominal export cable voltage (direct current [DC]): ±320 kV • Length per export cable beneath seabed: 97–124 mi (156–200 km) • Cable/pipeline crossings: up to 16 • Target burial depth (below level seabed): 3.2–13.1 ft (1.0–4.0 m)
Aquidneck Island Onshore Export Cable Route (intermediate landfall)	• Portsmouth, Rhode Island • Nominal underground onshore export cable voltage for DC transmission: ±320 kV • Up to 4 onshore export cables and up to 2 communications cables • Up to 3 mi (4.8 km) per cable
Falmouth Landfall Site a/	• Three locations under consideration: Worcester Avenue, Central Park, and Shore Street • Installation methodology: HDD
Brayton Point Landfall Site	Brayton Point • Two locations under consideration: Eastern and Western shorelines of Brayton Point • Installation methodology: HDD Aquidneck Island • Several locations under consideration for the intermediate landfall across the island • Installation methodology: HDD
Onshore Export Cables from Landfall to Onshore Substation a/	• Falmouth, Massachusetts • Nominal underground onshore export cable voltage for AC transmission: 200–345 kV • Up to 12 onshore export power cables and up to five communications cables

Component	Summary
	• Up to 6.4 mi (10.3 km) per cable
Onshore Export Cables from Landfall to HVDC Converter Station	• Somerset, Massachusetts • Nominal underground onshore export cable voltage for DC transmission: ±320 kV • Up to 6 onshore export cables and up to 2 communications cables • Up to 0.7 mi (1.0 km) per cable
Onshore Substation a/	• Falmouth, Massachusetts • Two locations under consideration: Lawrence Lynch and Cape Cod Aggregates • Up to 26 ac (10.5 ha) for the substation yard • Transform to 345 kV • Air-insulated substation (AIS) or gas-insulated substation (GIS) configurations
HVDC Converter Station	• Somerset, Massachusetts • Up to two HVDC converter stations • Up to 7.5 ac (3 ha) of permanent disturbance • Up to 10 ac (4 ha) of permanent and temporary disturbance • Convert the power from DC to 345 kV AC for injection to the existing ISO-NE grid system
Transmission Line from Onshore Substation to Falmouth POI a/	• Falmouth, Massachusetts • New 345-kV overhead transmission line along existing utility ROW (preferred) • To be designed, permitted, constructed, and operated by transmission system owner, Eversource • New, 345-kV underground transmission line (alternate) • Up to 2.1 mi (3.4 km) in length
Transmission Line from HVDC Converter Station to Brayton Point POI	• Somerset, Massachusetts • New, 345-kV underground transmission line • Up to 0.2 mi (0.3 km) in length
Falmouth POI a/	• Falmouth, Massachusetts • Upgrades to existing Falmouth Tap (new or upgraded POI by Eversource)
Brayton Point POI	• Somerset, Massachusetts • Existing, National Grid substation 345-kV GIS breaker building at National Grid substation Station

Note:
a/ if Falmouth is the selected POI for Project 2

3.3.1 Substructures

The substructure's primary function is to support the WTGs and OSPs by transferring the dynamic mechanical load to the seabed. Substructures also act as an access point to the WTGs or OSPs and provide a conduit for electrical cables. A substructure is defined as the support structure which extends upwards from the seabed and connects the base of the WTG tower, while a foundation transfers the loads acting on the structure into the seabed. For example, a jacket substructure could have four foundations or piles that impact the seabed. Designs can vary depending on water depth, WTGs or OSPs size, and soil conditions. SouthCoast Wind is considering three substructure concepts: monopile, piled jacket, and suction-bucket jacket. The Project will develop and install up to two different substructure concepts for the WTGs (up to 85 suction-bucket jackets total under consideration for Project 2 only) and may use a third different concept for the OSPs. See **Table 3-2** and **Table 3-3** for the maximum substructure parameters within the PDE. Below, design description and parameters are presented for each substructure type, including typical values, which will be confirmed in the Facility Design Report (FDR) which SouthCoast Wind will submit for BOEM's review pursuant to 30 CFR §§ 285.700-702.

Each substructure is described below with its foundations and basic parameters. Following the substructure component descriptions are sections describing substructure construction and installation, operation and maintenance, and decommissioning.

For all substructure and foundation types, the seabed may be leveled to prepare for installation. Scour protection may also be applied before or after installation. Scour and scour protection are discussed further in Section 3.3.1.9.

TABLE 3-2. MAXIMUM WTG SUBSTRUCTURE PARAMETERS

Substructure Type	Number of Foundations (pile, bucket) per Substructure	Penetration Below Level Seabed	Foundation Diameter (pile, bucket)	Seabed Centerline Diameter	Footprint Diameter a/
Monopiles	1	164.0 ft (50.0 m)	52.5 ft (16.0 m)	-	374.0 ft (114.0 m)
Piled Jacket	4	229.6 ft (70.0 m)	14.7 ft (4.5 m)	164.0 ft (50.0 m)	380.5 ft (116.0 m)
Suction-Bucket Jacket	4	65.6 ft (20.0 m)	65.6 ft (20.0 m)	180.4 ft (55.0 m)	521.6 ft (159.0 m)

Note:
a/ Diameter measures across combined area from foundation, scour protection, and mud mats

TABLE 3-3. MAXIMUM OSP SUBSTRUCTURE PARAMETERS

OSP Option	Substructure Type	Foundations per Substructure	Penetration Below Level Seabed	Piles or Bucket Diameter at Mudline	Seabed Centerline Diameter or Dimension	Permanent Footprint Area a/
Option A–Modular	Monopile	1	164.0 ft (50.0 m)	52.5 ft (16.0 m)	52.5 ft (16.0 m)	2.52 ac (1.02 ha)
	Piled jacket	3 to 4 foundations and 1 to 2 piles/foundation = 3 to 8 piles	229.6 ft (70.0 m)	14.7 ft (4.5 m)	164.0 ft (50.0 m)	2.61 ac (1.05 ha)
	Suction-bucket jacket	4 foundations and 1 bucket/foundation = 4 buckets	65.6 ft (20.0 m)	65.6 ft (20.0 m)	180.4 ft (55.0 m)	4.90 ac (1.98 ha)
Option B–Integrated	Piled jacket	4 to 6 foundations and 1 to 3 piles/foundation = 4 to 12 piles	277.2 ft (84.5 m)	11.7 ft (3.57 m)	213 x 105 ft (65 x 32 m)	7.54 ac (3.05 ha)
Option C–DC Converter	Piled jacket	4 foundations and 3 to 4 piles/foundations = up to 16 piles	262.4 ft (80.0 m)	12.8 ft (3.9 m)	279 x 197 ft (85 x 60 m)	9.79 ac (3.96 ha)

Note:
a/ Includes combined area from foundation, scour protection, and mud mats

3.3.1.1 Monopiles

The monopile substructure is a single steel cylindrical pile that is embedded into the seabed. This type of substructure is comprised of a monopile and transition piece (TP), which may be integrated (i.e., extended monopile) or separate. The monopile is driven into the seabed and connects to the TP, further discussed below. The TP connects the monopile to the WTG tower and carries the secondary steel components such as access platforms, ladders, boat fenders, and landings. Monopiles can be used for both supporting the WTGs and the Modular OSP, Option A. A diagram of a monopile can be seen in **Figure 3-7**. This type of substructure is comprised of a monopile and a TP which may be integrated (i.e., extended monopile) or separate. The monopile is driven into the seabed and connects to the TP, as further discussed in Section 3.3.1.5.3. The TP connects the monopile to the WTG tower and carries the secondary steel components such as access platforms, ladders, boat fenders, and landings.

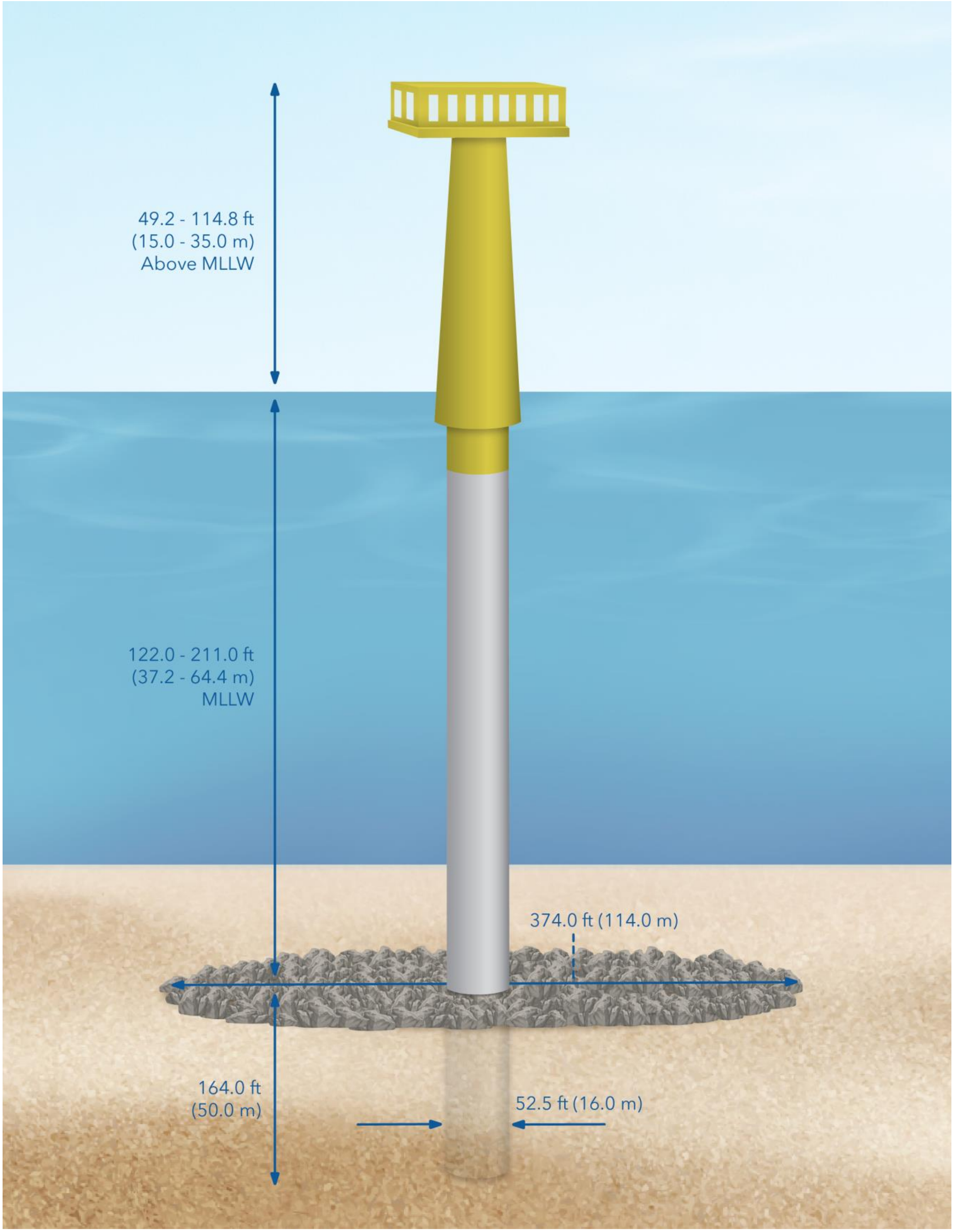


FIGURE 3-7. INDICATIVE WTG MONOPILE SUBSTRUCTURE DIAGRAM

3.3.1.2 Piled Jackets

Jacket structures are large lattice structures fabricated of steel tubes welded together. Jackets will consist of three- or four-legged structures to support WTGs and four to nine-legged structures to support OSPs. If the jacket is piled, each leg will be anchored by one pile foundation for WTGs and up to three pile foundations per leg for OSPs. The jacket structure can also hold secondary structures including, but not limited to, boat landings and cable tubes. Jackets distribute loads in an axial direction, allowing for this relatively light structure to withstand deeper water depths and larger WTGs and OSPs. **Figure 3-8** depicts a piled jacket, including the substructure’s range of specifications under consideration for supporting WTGs.

3.3.1.3 Suction-Bucket Jackets

Suction-bucket jackets have a similar steel lattice design to the piled jacket but diverges at the connection to the sea floor. These substructures use suction-bucket foundations instead of piles to secure the structure to the seabed. **Figure 3-9** depicts a suction-bucket jacket, including the substructure’s range of specifications under consideration.

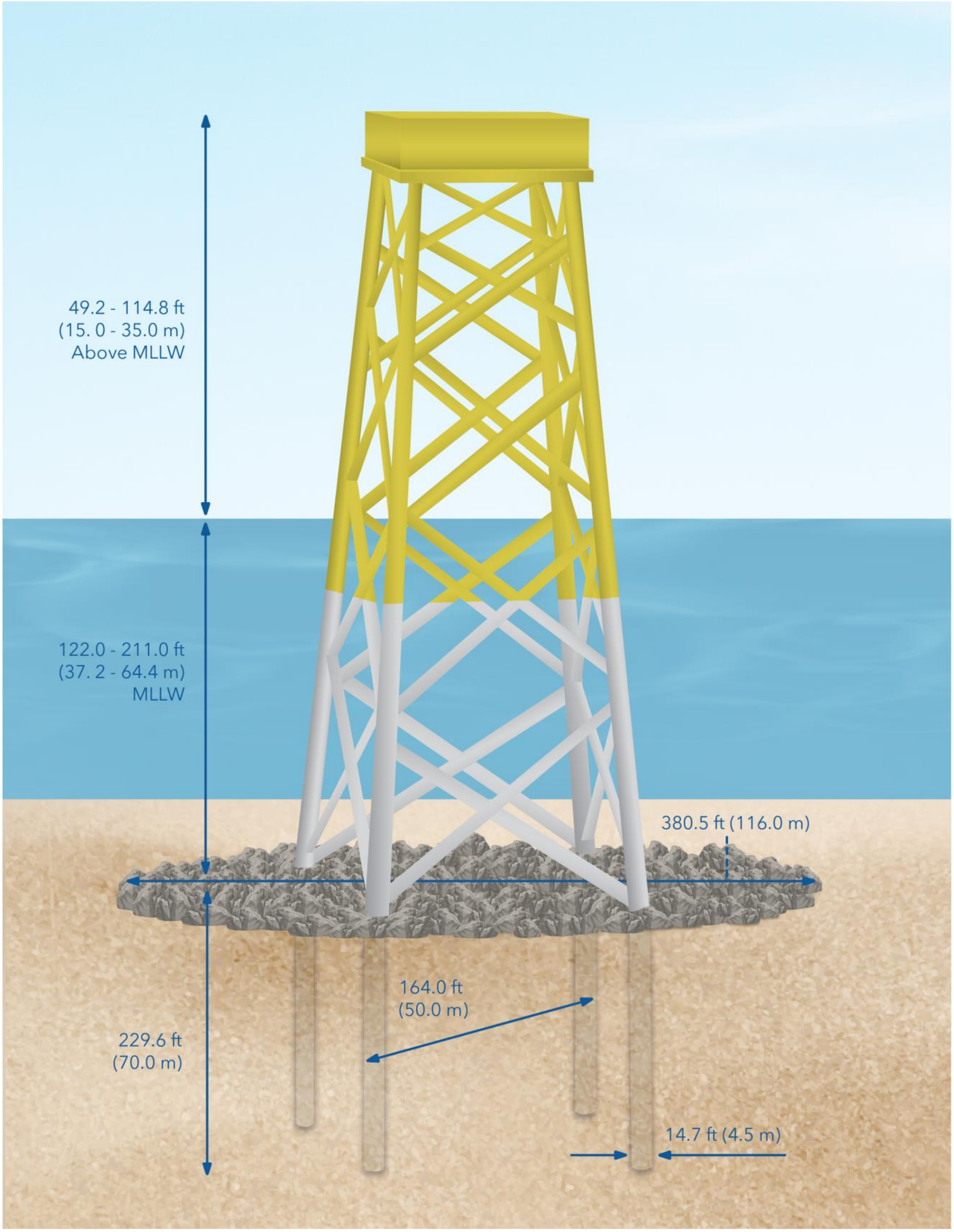


FIGURE 3-8. INDICATIVE WTG PILED JACKET SUBSTRUCTURE DIAGRAM

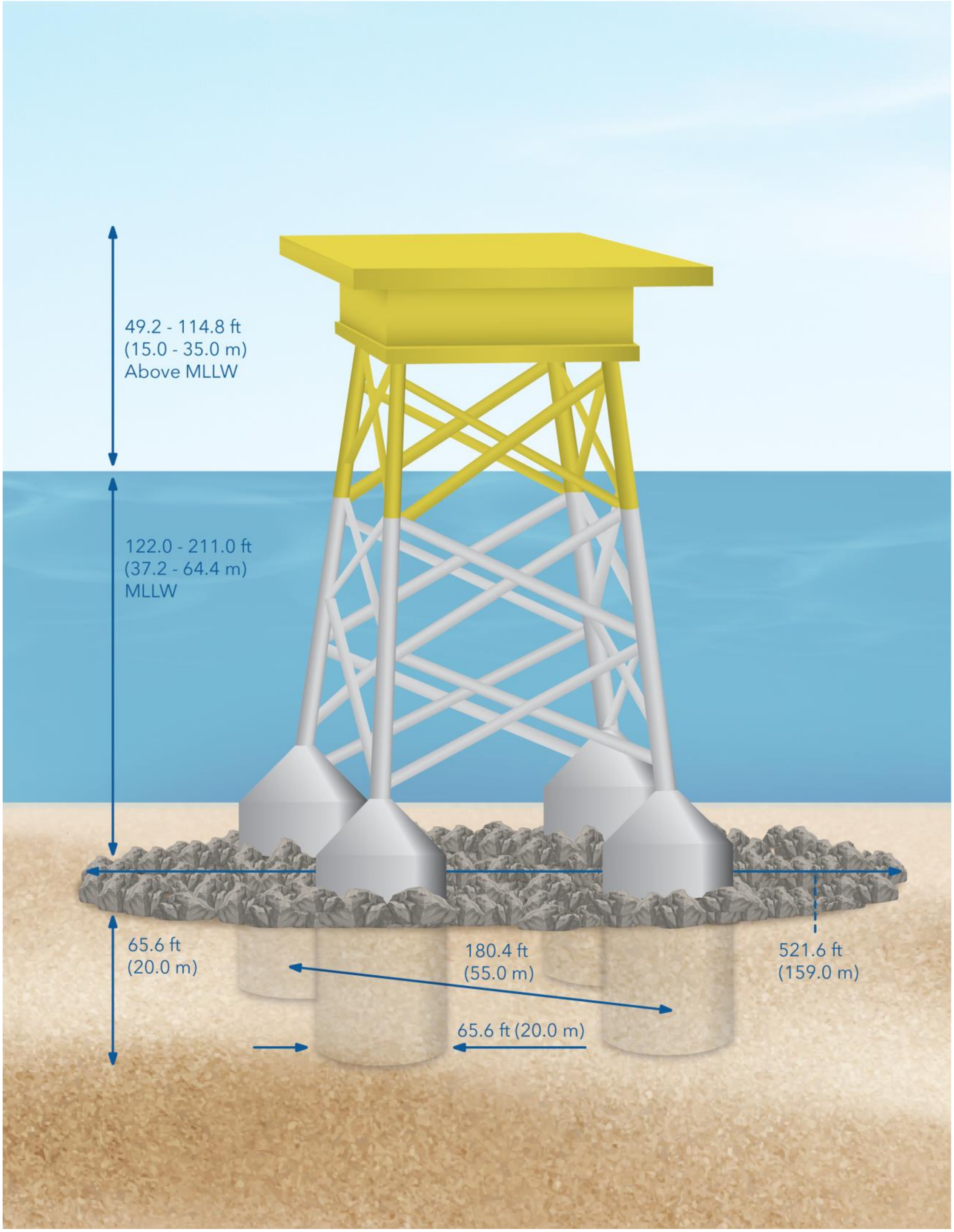


FIGURE 3-9. INDICATIVE WTG SUCTION-BUCKET SUBSTRUCTURE DIAGRAM

3.3.1.4 Construction and Installation

3.3.1.4.1 Fabrication and Transportation

As described above, the Project is considering three substructure types. All substructure types may be fabricated in one or more locations and then moved to a location to be assembled and finally moved to a quayside or waterway to be transported.

Once all pre-assembly work is completed including necessary coatings, the substructure components will be transferred to transport vessels. Substructures will be loaded out on the transport vessel(s) using Self-Propelled Modular Transporter, skidshoes, or crawler cranes. Monopiles are typically loaded horizontally. Jackets could be loaded vertically or horizontally. Jacket piles may be loaded on pre-designed saddles or supports.

Substructures and foundations could then be transported to one or more marshalling yards or directly to the installation site. There are several methods to deliver the substructures to the installation site. The components may be loaded directly onto installation vessels from the fabrication or marshalling yard and transported to the installation location. Another option is to load out the substructure components on a feeder vessel and deliver to the installation vessel. Finally, substructures such as monopiles may be towed in a floating position to the installation vessel.

After final design is determined, the Project's logistics plan will determine the number of substructures and foundations transported on each trip.

3.3.1.4.2 Installation

Once the substructures are fabricated and transported to the site, they are ready for installation. The installation vessels could be jack-up, dynamic positioning (DP), or semi-submersible vessels. Each substructure would be installed to their design depths. For monopiles and piled jackets, this involves hammers to drive the foundations to the design seabed penetration depths using an appropriately sized hydraulic impact hammer, vibratory hammer, water jetting, or combinations of all. Typical pile installation procedures utilize a low energy soft start method with a gradual increase in hammering energy levels. The soft start method effectively provides a warning to marine and avian animals allowing them time to distance themselves from the construction activity before the full-energy hammering commences. Each substructure type's specific installation parameters are discussed in detail in the following four sections: 3.3.1.5.3 through 3.3.1.5.6.

3.3.1.4.3 Monopile Installation

Monopiles are expected to be installed to their design depth using hammers. In the event hammering alone cannot reach the required installation depth due to the presence of boulders or dense soils, relief drilling may be utilized to remove soil to achieve the required pile penetration depth. Pile driving parameters for monopiles are listed below in **Table 3-4**.

TABLE 3-4. PILE DRIVING PARAMETERS FOR MONOPILES

Pile Driving Parameters	Monopile
Maximum pile hammer size (kilojoules [kJ])	6,600 kJ
Maximum penetration depth into seabed (ft [m])	164.0 ft (50.0 m)
Approximate duration of pile driving (hours per foundation)	4 hours
Maximum number of piles installed per day	2 per day
Maximum number of hammers simultaneously hammering	2

After the foundation and main substructures are installed, if there is a separate TP, it would be installed next. The TP may be connected via a grouted, bolted flange, or slip joint connection. Refer to Section 3.3.1.8 for connection types and details. If there is no separate TP, as in an extended monopile design, an internal cage carrying the electrical equipment and the secondary steel components will be attached directly to the substructure.

3.3.1.4.4 Piled Jacket Installation

Piled jackets can be installed using a pre-piling or post-piling installation sequence.

Pre-piled jacket installation is multi-stage where the seabed is prepared and then a reusable template is placed on the seabed for accurate positioning of piles. Pin piles are individually lowered into the template and driven to their design depth, using a hammer, as stated in **Table 3-5**. Then the template is picked up and moved to the next location. In a subsequent stage of the installation process, a vessel lifts the jacket off the feeder barge or installation vessel and lowers it over the pin-piles. Pile guides on the bottom of the jacket legs direct the substructure into place. This could be directly after the piling vessel or a season or year later. Pre-piling jacket installation has the benefit of separating the piling vessel from the jacket lift vessel and is the typical method for WTG jackets.

Post-piling installation is a sequence where the seabed is prepared and the jacket is set on the seafloor, then the piles are driven through the jacket legs to the design penetration depth. Post-piling jackets are often the method used for OSP jacket installation because there is limited benefit to creating and reusing a template when there are fewer OSPs to install in series.

TABLE 3-5. PILE DRIVING PARAMETERS FOR JACKETS

Pile Driving Parameters	Piled Jacket
Maximum pile hammer size (kJ)	3,500 kJ
Maximum penetration depth into seabed (ft [m])	229.6 ft (70.0 m)
Approximate duration of pile driving (hours per foundation)	2 hours per pile
Estimated maximum number of piles installed per day	8 per day
Maximum number of hammers simultaneously hammering	2

In both cases, the piles connect to the jacket via grouted or swaged connections or a combination of the two, as discussed in Section 3.3.1.8. A second crane vessel or another support vessel may perform grouting tasks, freeing the installation vessel to continue jacket installation at subsequent WTG and OSP locations.

For WTGs, jackets will likely be pre-piled. The piled jackets for the WTGs will have three or four legs and one or two pin-piles per leg. The OSP piled jacket could have up to nine legs with up to three pin-piles per leg, resulting in up to 27 pin-piles for a maximum OSP jacket. The nine-leg OSPs would be for the largest type of OSP only–Option C. OSP parameters are described further in Section 3.3.3.

3.3.1.4.5 Suction-Bucket Jacket Installation

During installation of this substructure type, the jacket is lowered to the seabed, the open bottom of the bucket and weight of the jacket embeds the bottom of the bucket in the seabed. To complete the installation and secure the foundation, water and air are pumped out of the bucket creating a negative pressure within the bucket which embeds the foundation buckets into the seabed. The jacket can also be leveled at this stage by varying the applied pressure. The pumps will be released from the suction buckets once the jacket reaches its designed penetration (**Table 3-2**). The connection of the required suction hoses is typically completed using a remotely operated vehicle (ROV).

3.3.1.5 Operation and Maintenance

Substructures will have internal and external inspections every two years that are important to ensure structural integrity. ROVs or Autonomous Underwater Vehicles (AUV) will be deployed for general underwater visual inspections that may include but are not limited to detection of corrosion, damage to the substructure, cracks at welds, excessive marine growth, and seabed scour. Divers may be used in a limited capacity for inspection or repair activities, but SouthCoast Wind aims to reduce the associated risk to divers when it is reasonably practicable to complete tasks with other technology. Qualified personnel will conduct the inspections, review the data collected, and report findings to the SouthCoast Wind O&M team.

Unscheduled maintenance is difficult to predict intrinsically, but the SouthCoast Wind O&M team will utilize remote monitoring systems to detect failures needing repair and will deploy maintenance activities as necessary. Final O&M strategies including inspection and maintenance frequencies will be finalized based on substructure selection and will be presented in the FDR.

3.3.1.6 Decommissioning

Generally, substructure decommissioning activities are expected to occur in the reverse order of construction and installation activities. In accordance with 30 CFR § 285.910, foundations that penetrate the seabed will be cut 15.0 ft (4.6 m) below the mudline. Alternatively, complete removal may be achieved. SouthCoast Wind will assess the removal of scour protection depending on which strategy minimizes environmental impacts. Heavy transport vessels, barges, or tugboats will then transfer the substructures ashore. Reusing and/or recycling the substructure for scrap metal or other materials will the preferred method of disposal.

3.3.1.7 Connections

The design of offshore wind substructures often involves connections that are made offshore. In the case of the monopile, the TP, if separate, is required to be connected after the monopile is hammered, because the TP and associated secondary steel are not designed to withstand such forces during pile driving. For the piled jacket, similarly, the piles are designed to be installed independent of the lattice structure. Fabrication onshore is often completed through welding, which then requires subsequent coating protection; for fabrication offshore, there are alternatives that enable suitable fixing. These are most commonly; grouting, bolting, swaging, or slip joints, each discussed in further detail below.

3.3.1.7.1 Grouting

Grouting involves pumping grout into the annulus between the pile and jacket legs or the monopile and TP. The high strength structural grout, when fully hardened, will provide a solid connection between the pile and the jacket structure for full load transfer. Additionally, in the case of a bolted TP, grout can also be used to fill the anulus between the TP skirt and the monopile to prevent corrosion of the bolts. Grout lines may be placed on the substructure at the time of fabrication, through which grout is injected once the piles are driven or after the TP is installed.

To prevent loss of grout and mitigate the risk of spillage, grout seals may be utilized. The seals are placed at the bottom of the grouted connection, in the space between piles and jacket legs or monopile and TP, and can be a passive or active type. The passive type is usually a tight-fitting rubber seal and the active type is an inflatable seal that gets inflated before the grout injection.

3.3.1.7.2 Swaged Connection

A swaged connection can be utilized to connect a pile to the jacket sleeve. The external sheath on the jacket includes inner grooves on the internal wall. When the pile is driven to the target penetration within the sheath, a hydraulic swaging tool is lowered into the pile. Hydraulic rams then plastically deform the pile to mate within the grooves of the sheaths, forming a fixed connection. This can also be used in combination with grouting.

3.3.1.7.3 Bolted Flange Connection

Bolted flange connections are used to connect the monopile to the TP and the TP to the tower for all WTG tower section connections. Alternative fastening systems, which are in development, may also be utilized in replacement for traditional bolts. A bolted connection may use non-structural grouting as a measure to ensure water tightness and protect the flange from corrosion.

3.3.1.7.4 Slip Joint Connection

A slip joint, either a single or multiple ring system, relies on friction between conical sections. The joint is initially made through the self-weight of the top section and over time becomes tighter. This has been deployed both on WTG tower sections as well as connections between TPs and monopiles.

3.3.1.8 Scour Protection and Seabed Preparation

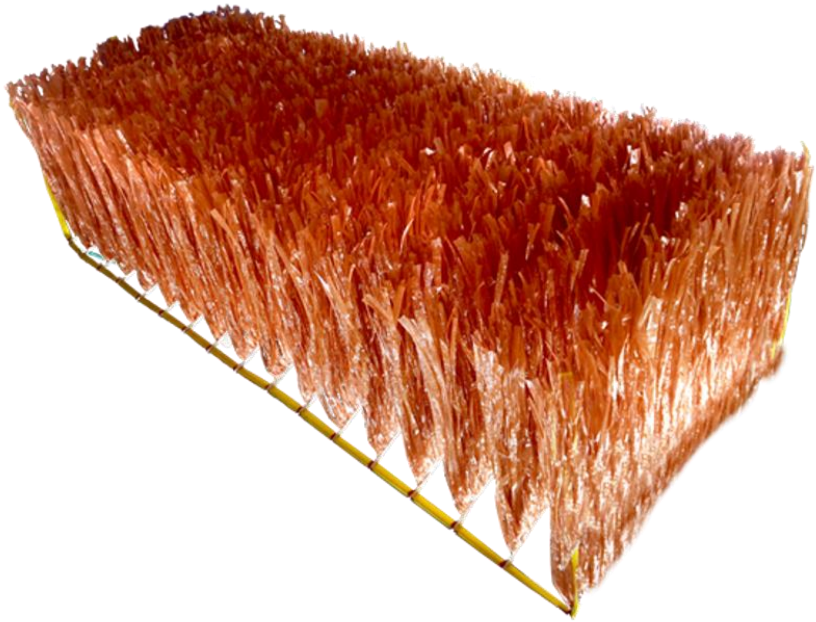
Scour is the erosion of sediment away from the base of offshore structures due to hydrodynamic forces including seabed drag that results in a hole around the piles or support structure base. Scour protection is the placement of material on the seafloor around the substructures to prevent the development of scour created by the presence of the structures. Each substructure used for WTGs or OSPs may require individual scour protection. The type and amount of scour protection utilized will vary depending on the substructure used. For a substructure that utilizes seabed penetration in the form of piles or suction caissons, the use of scour protectant to prevent scour development results in minimized substructure penetration.

Scour protection considered for the proposed Project includes rock, concrete mattresses, sandbags, artificial seaweeds/reefs/frond mats, or self-deploying umbrella systems (typically used for suction-bucket jackets). Scour protection examples can be seen in **Figure 3-10** through **Figure 3-12**. For installation, these systems can be either pre- or post-installed.

Rock bag construction will typically be either meshed steel or synthetic (polyester or similar). If a synthetic material is used, the material will typically be tested for long-term durability with laboratory and in-situ data available to support. The material will typically be designed and tested to maintain integrity under ultraviolet (UV) exposure, though UV exposure becomes much less significant on the seabed. SouthCoast Wind will consider and review such test data and operational history prior to deployment of a specific manufacturer's rock bag (if used), to ensure that integrity will be maintained over the operational life of the Project, including at the end of field life should removal be recommended or required.

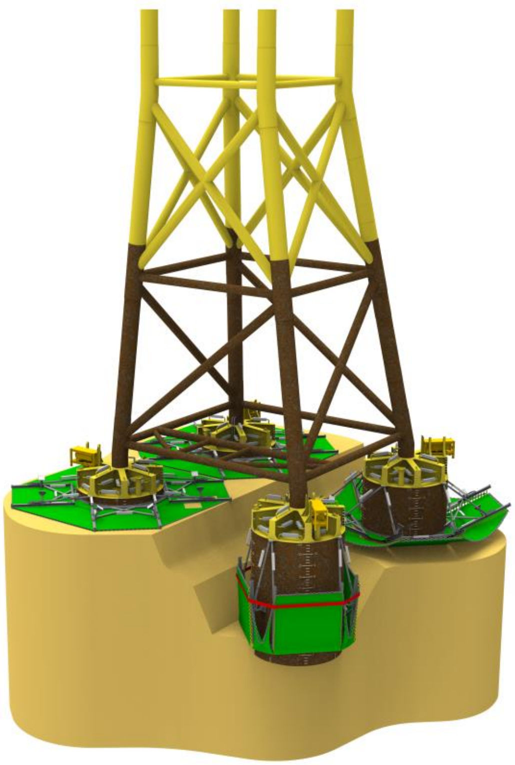
Source: Kyowa, 2015

FIGURE 3-10. EXAMPLE OF ROCK BAG SCOUR PROTECTION



Source: SSCS, 2020

FIGURE 3-11. EXAMPLE OF FROND MAT SCOUR PROTECTION



Source: SPT Offshore, 2020

FIGURE 3-12. EXAMPLE OF SELF-DEPLOYING UMBRELLA SYSTEMS FOR SCOUR PROTECTION

Fronded mattress construction typically includes polypropylene or similar fronds. Significant operational history is available, particularly in the North Sea. Similar to rock bags, UV exposure is typically considered in material design, though UV exposure becomes much less significant on the seabed. Additionally, fronded mattresses are designed to mitigate scour by accumulating soft sediment, so the polypropylene (or similar) fronds will typically be further protected from any UV exposure. SouthCoast Wind will consider and review test data and operational history prior to deployment of a specific manufacturer's fronded mattress (if used), to ensure that integrity will be maintained over the operational life of the Project, including at the end of field life should removal be recommended or required.

Scour protection parameters for WTG and OSP substructure options under consideration are presented in **Table 3-6** and **Table 3-7**. For more details on scour, see Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure. Final design will take the results of the scour modeling into consideration.

TABLE 3-6. ESTIMATED MAXIMUM SCOUR PARAMETERS PER MAXIMUM WTG SUBSTRUCTURE

Scour Parameters	Monopile	Piled Jacket	Suction Bucket Jacket
Scour protection area (including substructure footprint) per substructure	2.52 ac (1.02 ha)	2.61 ac (1.05 ha)	4.91 ac (1.99 ha)
Scour protection volume	36,256 yd^3 (27,720 m^3)	37,635 yd^3 (28,774 m^3)	75,583 yd^3 (57,787 m^3)

TABLE 3-7. ESTIMATED MAXIMUM SCOUR PARAMETERS PER OSP

Scour Driver	Pin-Pile Jacket
Scour protection area (including substructure footprint) per substructure	9.79 ac (3.96 ha)
Scour protection volume	157,193 yd^3 (120,183 m^3)

For both scour protection and seabed preparation activities, the results of detailed geological campaigns and assessments will support the final decision of the extent of leveling and scour protection required. With collected data, a scour assessment study was prepared for the COP (Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure). This report presents the input, methodology, and evaluation results of BOEM specific recommendations for evaluation of scour around foundations and dispersion of sediment and depositions related to cable jetting/burial. SouthCoast Wind will follow BMPs and all relevant regulations when installing scour protection around substructures.

While seabed leveling activities are required to be carried out before the substructure installation and are more typical for suction-bucket jackets, there is more flexibility in the order of events for scour protection.

Installation activities and order of events of scour protection will largely depend on the type and material used. In the case of rock scour protection, a rock placement vessel may be deployed. The thin layer of filter stones is typically placed before driving the piles, while the armor rock layer is typically installed afterward. Final scour protection strategy and installation will be refined during detailed design. Scour protection would follow the installation of these substructures. Frond mats, or umbrella-based structures may be pre-attached to the substructure, so are therefore simultaneously installed.

3.3.2 Wind Turbine Generator

The proposed Project will use WTGs designed to operate in offshore conditions specific to the Lease Area. The WTG parameters are listed in **Table 3-8** while **Figure 3-13** depicts the component dimensions. The main components of the WTG include the nacelle, the rotor, three blades, and the tower. The rotor transfers rotational energy to the nacelle through the main shaft. The nacelle contains the vital components of the WTG including the generator, transformers, converter, and additional subsystems necessary to generate electricity and control WTG functionality. The nacelle will be positioned on a multi-sectional tower attached to a TP or substructure depending on the substructure design selected. Substructures under consideration for the WTGs are described in Section 3.3.1.

As required by 30 CFR § 285.705, the CVA will review and verify that all WTG design standards are met and are compatible with site specific conditions. The WTGs will be designed to operate within a certified set of loading scenarios and withstand a certified set of climatic conditions (see Section 4.3 and Section 4.4 for oceanographical, meteorological, and geological design criteria and recommendations).

TABLE 3-8. WTG PARAMETERS

WTG Parameter	Minimum	Maximum
Rotor diameter	721.7 ft (220.0 m)	918.6 ft (280.0 m)
Rotor swept area	409,168.5 ft^2 ($38,013.0\ m^2$)	662,787.8 ft^2 ($61,575.0\ m^2$)
Blade length	351.0 ft (107.0 m)	452.8 ft (138.0 m)
Tip height above MLLW	779.5 ft (237.6 m)	1,066.3 ft (325.0 m)
Hub height above MLLW	418.7 ft (127.6 m)	605.1 ft (184.4 m)
Tip clearance (air gap) above highest astronomical tide	75.5 ft (23 m)	124.7 ft (38 m)

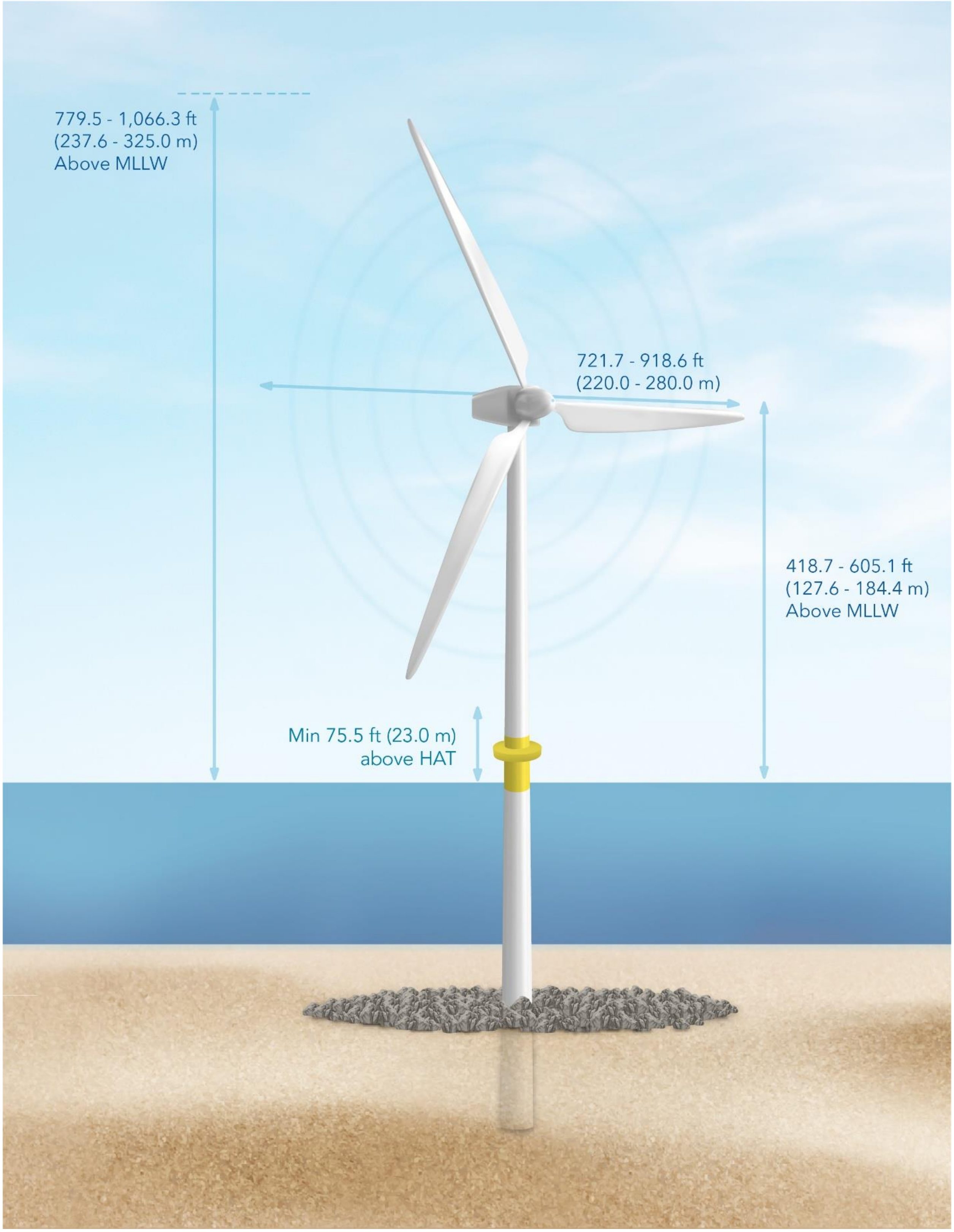


FIGURE 3-13. INDICATIVE WTG DIAGRAM

3.3.2.1 Construction and Installation

Following installation of the WTG substructures and inter-array cables, the WTGs will be installed on the prepared substructures, unless already pre-installed as described in Section 3.3.1.5.2. The WTGs will be delivered to the marshalling port as individual components generally consisting of the rotor blades, nacelle, and tower sections. WTGs will either be assembled or partially assembled at the port and transported to the installation site or will be loaded onto the installation vessel(s) for completion of the offshore assembly at the installation site. The proposed Project is considering the use of heavy lift vessels, barges, feeder vessels, and roll-on lift-off vessels to transport WTG components to the Lease Area for installation by the WTG installation vessel (see Section 3.3.14 for details pertaining to each type of vessel). The ideal logistical solutions for vessel usage, component transportation, and installation that complies with applicable U.S. laws will be developed with selected installation contractors.

WTGs are the final Project components to be installed, consistent with the indicative Project schedule shown in **Figure 3-6**. Multiple installation vessels (a jack-up vessel or vessel, floating, semi-submersible) will be used for WTG installation. Jack-up vessels lower their legs into the seabed for stability then lift out of the water, as shown in **Figure 3-14**, whereas DP vessels utilize computer-controlled positioning systems and thrusters to maintain their station. The installation vessel will be positioned next to the installed substructure, taking the necessary precautions not to impact the inter-array cables. How the WTG will be installed depends on the amount of pre-assembly that will be completed at the marshalling port, the substructure type, WTG type, and installation vessel. Potential installation methods include the installation of fully assembled WTGs or the entire erection of the WTG on a component-by-component basis. If WTG components are transported to the site disassembled, the WTG tower will first be connected to its designated substructure (described in Section 3.3.1) and secured. The installation vessel will lift the nacelle and hub onto the tower, then attach each rotor blade to the hub. A utility generator may be used to keep the WTGs crucial components functional.

Source: (DNV, 2021)

FIGURE 3-14. EXAMPLE OF A JACK-UP VESSEL INSTALLING A WTG

3.3.2.2 Operation and Maintenance

O&M activities for the WTGs include planned maintenance activities (such as scheduled maintenance and repair campaigns) as well as unplanned activities (such as unplanned repairs and replacements). To minimize the need for unscheduled maintenance, the WTGs will include a high level of remote component monitoring and analytics to track component condition. Major scheduled repairs will be planned in yearly campaigns, where specialists and heavy logistics will be arranged through long-term agreements.

Trained and experienced Project personnel will have access to the WTGs interior via marked access points for O&M procedures. Personnel, tools, and spare parts are typically sent up the tower via a service lift within the tower. A ladder can be accessed as an alternative route, or parts can be placed from a helicopter or drone directly on the Heli hoist landing platform. Bulkier tools or spare parts may be lifted up to the nacelle outside the tower via a nacelle-mounted service crane or a winch system located at the rear of the nacelle.

Planned maintenance activities involve proactively inspecting components and equipment for signs of wear and tear that are commonly known to need replacement in accordance with the WTG supplier's specified maintenance schedule. Statutory inspections of WTGs safety and electrical equipment will occur in conformance with all applicable regulations. Unplanned maintenance may involve responding to an unplanned outage or equipment failure. This may require the use of a jack-up vessel or transportation vessel to carry, install, and/or repair the failure in question. **Table 3-9** lists the primary maintenance activities along with the potential frequency of visits.

TABLE 3-9. INDICATIVE O&M WTG TASK AND SCHEDULE

O&M Task	Inspection Cycle
Planned annual maintenance	Annually
Routine maintenance and regulatory inspection including lifesaving equipment a/	Annually
Blade inspections (may be inspected by drone)	Every 1 to 3 years
Hydraulic oil change per WTG on average	Every 10 years
Gear oil change per WTG (not applicable to direct drive)	Every 6 to 8 years
Any routines in addition to above	Every 5 and 10 years
Unplanned maintenance	As needed
Approximate visits for unscheduled maintenance	Annually

Note:
a/ Lifesaving Equipment is defined in 46 CFR Part 160 and includes equipment located on WTGs and OSPs such as life preservers, life rafts, first aid kits, and hand flares used for distress signals.

3.3.2.3 Decommissioning

SouthCoast Wind will disconnect, dismantle, and remove WTGs at the end of their operational life. To begin, all fluids will be properly drained, transported to shore, and safely recycled or disposed of as established by the decommissioning plan. WTGs may be disassembled into the nacelle or nacelle components, rotor blades, and tower. Heavy transport vessels or barges will then transfer WTG components ashore.

Reusing and/or recycling the WTGs for scrap metal or other materials will be the preferred method of disposal. Generally, WTG decommissioning activities will have similar environmental impacts as construction and installation activities.

3.3.3 Offshore Substation Platform

The OSP serves several functions. It is a collection and termination point for the inter-array cables that will deliver power generated from the WTGs from 60 to 72.5 kV. On the OSP, the voltage is increased to export voltage and controlled through the installed equipment, including switchgear, transformers, power conditioning, and control equipment. Finally, the OSP serves as the starting point for the export cables which take the power to the onshore grid system. This applies to the OSP for both AC and DC export voltage, with the OSP for a DC export voltage being more frequently referred to as a "DC Converter OSP" as the step-up of voltage also includes converting power from AC to DC. To perform this function, the DC Converter OSP contains HVDC valves and insulated-gate bipolar transistors to create the DC and is larger in size as it incorporates more intensive electrical equipment and consequent auxiliary equipment to accommodate the needs.

The proposed Project includes up to five OSPs to be located on the same 1 nm x 1 nm (1.9 km x 1.9 km) grid layout as the WTGs. Three OSP designs are under consideration, as described in the following subsections. Each OSP design includes a topside, which will house the electrical equipment, and a foundation substructure, which will support the topside. The parameters under consideration for the proposed Project's OSPs vary depending on design, construction, and installation strategies and are discussed further in this section. Specifications for each OSP design option considered are presented below in **Table 3-10**.

While the PDE includes up to five OSPs, SouthCoast Wind's preference and the most likely scenario is two HVDC OSPs, one for Project 1 (Brayton Point) and one for Project 2 (Brayton Point or Falmouth). SouthCoast Wind has selected an HVDC converter OSP (Option C) for Project 1. If HVDC is selected for Project 2, which is the most likely scenario, there would be one HVDC OSP for Project 2 in addition to the HVDC OSP for Project 1 (for a total of two HVDC OSPs). If HVAC is selected for Project 2, SouthCoast Wind anticipates there would be one HVAC OSP for Project 2 in addition to the HVDC OSP for Project 1 (for a total of two OSPs).

TABLE 3-10. OSP PARAMETERS

OSP Design Option	Compatible Substructure	OSP Topside Height (above MLLW)	Topside Dimension Range		
			L	W	H
Option A–Modular	Monopile, Piled Jacket, Suction-Bucket Jacket	164.0 ft (50.0 m)–242.5 ft (73.9 m)	147.6 ft (45.0 m)–295.3 ft (90.0 m)	114.8 ft (35.0 m)–164.0 ft (50.0 m)	98.4 ft (30.0 m)–147.6 ft (45.0 m)
Option B–Integrated	Piled Jacket	164.0 ft (50.0 m)–242.5 ft (73.9 m)	147.6 ft (45.0 m)–295.3 ft (90.0 m)	114.8 ft (35.0 m)–164.0 ft (50.0 m)	98.4 ft (30.0 m)–147.6 ft (45.0 m)
Option C–Direct Current (DC)	Piled Jacket	160.8 ft (49.0 m)–292.0 ft (89.0 m)	196.9 ft (60.0 m)–328.1 (100.0 m)	114.8.0 ft (35.0 m)–229.7 ft (70.0 m)	82.0 ft (25.0 m)–164.0 ft (50.0 m)

OSP Design Option	Compatible Substructure	OSP Topside Height (above MLLW)	Topside Dimension Range		
			L	W	H
Converter					

3.3.3.1 OSP Design Option A–Modular

SouthCoast Wind is considering several different designs, one of which is a "Modular OSP" design that would sit on any one of the types of substructure designs similar in size and weight to those considered for the WTGs (see Section 3.3.1), with the topside connected to a TP. This Modular OSP design is an AC solution and will likely hold a single transformer with a single export cable. This option is a small design relative to other options and thus, has benefits related to manufacture, transportation, and installation. An example of the Modular OSP on a jacket substructure is shown in **Figure 3-15**.

3.3.3.2 OSP Design Option B–Integrated

SouthCoast Wind is also considering an "Integrated OSP" design. This OSP would have a jacket substructure and larger topside than the Modular OSP. The Integrated OSP design is also an AC solution and is designed to support a high number of inter-array cable connections as well as the connection of multiple export cables. This design differs from the Modular OSP in that it is expected to contain multiple transformers and export cables integrated into a single topside. Depending on the final weight of the topside and soil conditions, the jacket substructure may be four- or six-legged and require one, two, or three piles per leg. The Integrated OSP's large size allows for the housing of a greater number of electrical components as compared to smaller designs (such as the Modular OSP), allowing for a smaller number of OSPs to support the proposed Project. An example of the Integrated OSP design can be seen in **Figure 3-16**.

3.3.3.3 OSP Design Option C–HVDC Converter

For the HVDC transmission solution, SouthCoast Wind is considering an "HVDC Converter OSP." The HVDC Converter OSP will convert electric power from HVAC to HVDC for transmission to the onshore grid system. This OSP could serve as a gathering platform for inter-array cables and then convert power from HVAC to HVDC or it could be connected to one or more HVAC gathering units and serve to convert power from HVAC to HVDC. The HVDC Converter OSP will include a cooling water intake structure (CWIS), requiring the use of up to 10 million gallons per day (MGD) of once-through non-contact cooling water at a maximum intake velocity of 0.5 feet per second (ft/s), discharged to a vertical pipe attached to the OSP foundation.

The HVDC Converter OSP will be installed on a piled jacket. A jacket substructure to support this large substation will have up to nine legs with up to three piles per leg. An example of a HVDC jacket OSP design is seen in **Figure 3-17**. The northernmost HVDC Converter OSP will be located outside of a 10 km buffer from the 30 m isobath from Nantucket Shoals.

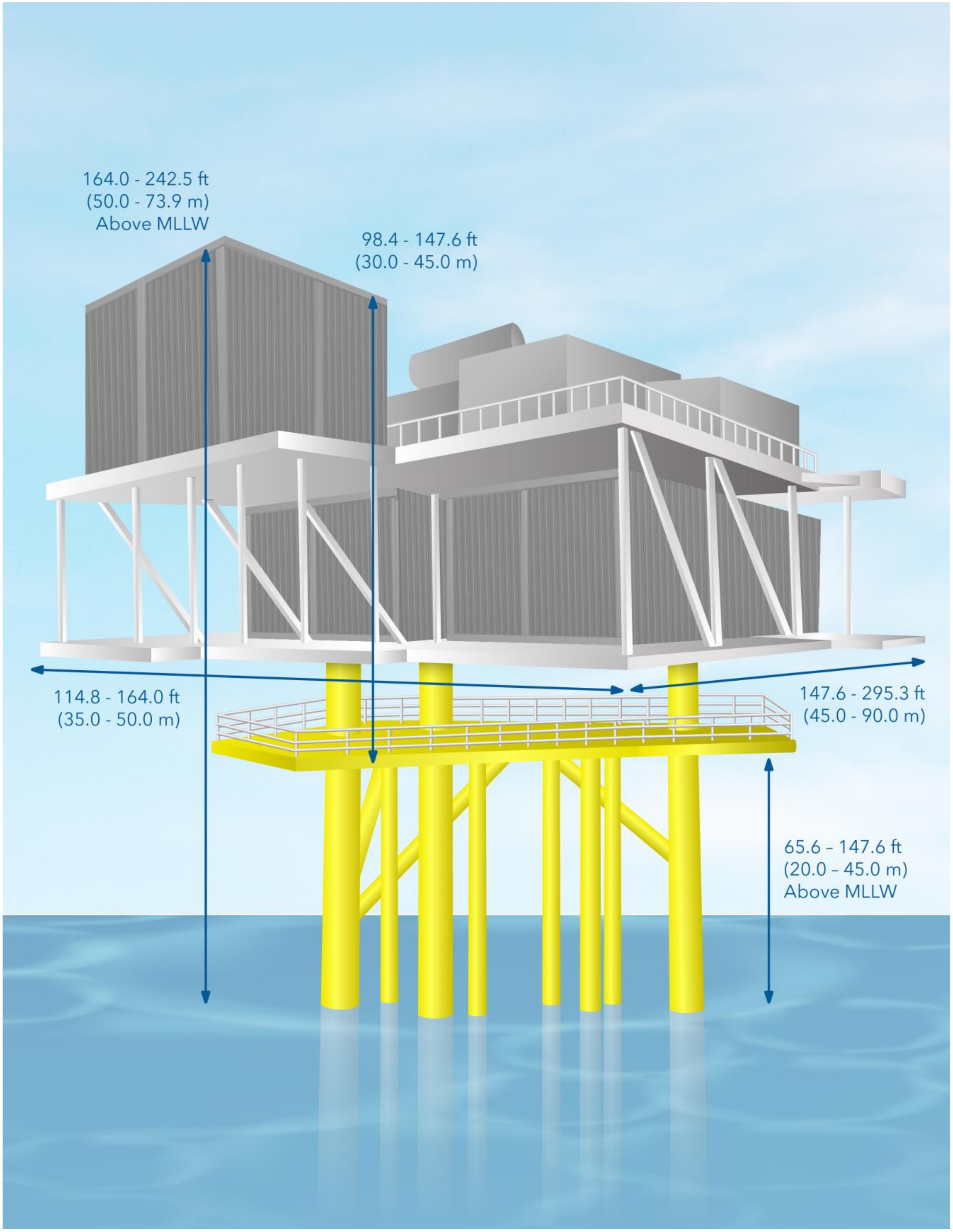


FIGURE 3-15. INDICATIVE MODULAR OSP DIAGRAM

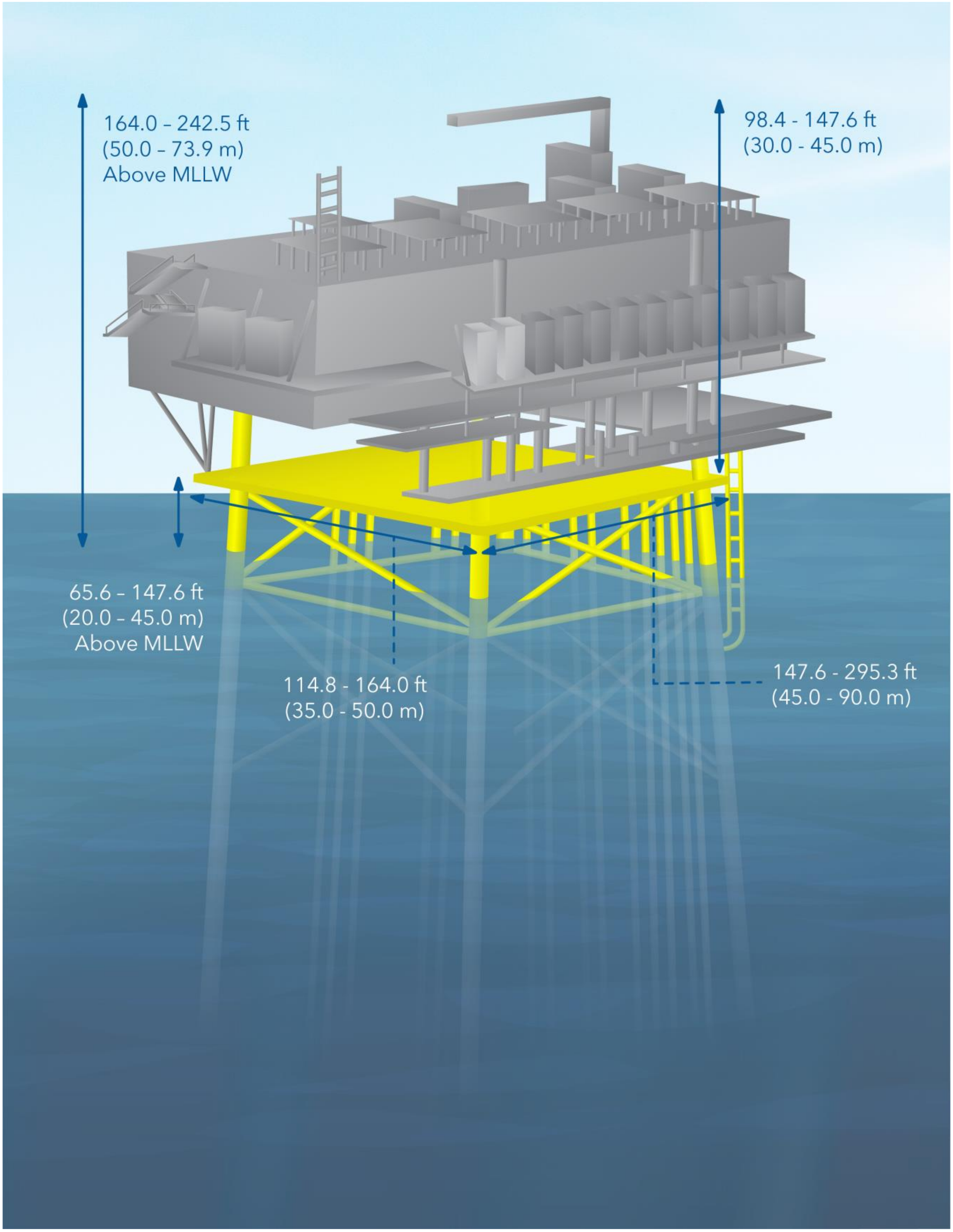


FIGURE 3-16. INDICATIVE INTEGRATED OSP DIAGRAM

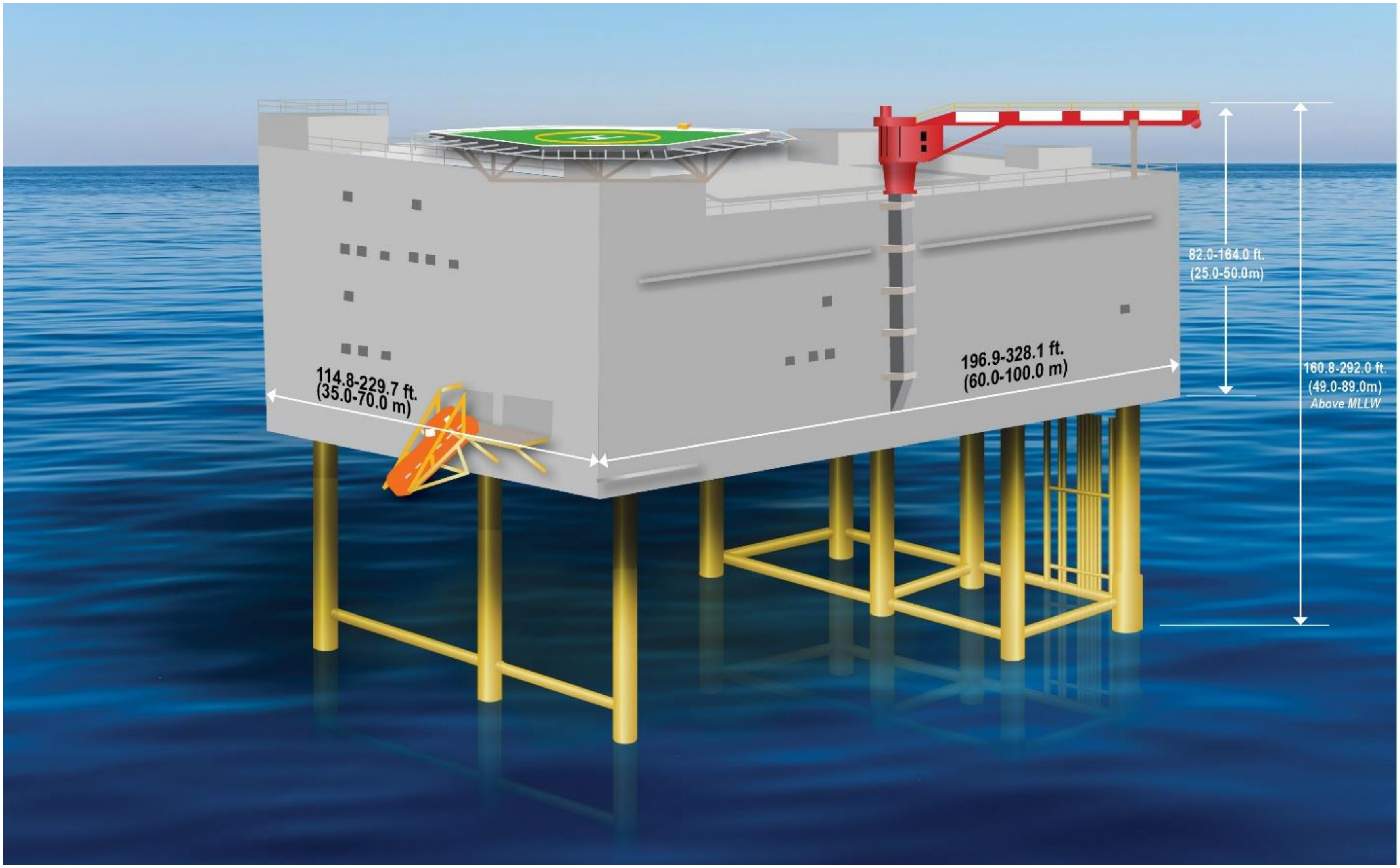


FIGURE 3-17. DC CONVERTER OSP DIAGRAM (WITH JACKET)

3.3.3.4 Construction and Installation

3.3.3.4.1 OSP Substructure

The OSP substructures may be shipped directly from the fabrication site to the Lease Area or may be shipped to a marshalling port for storage before transportation to the site. As described in **Table 3-10** above, the different OSP types could utilize different substructures for foundations. Foundation and substructure installation are described in Section 3.3.1.5.

3.3.3.4.2 Option A (Modular) and Option B (Integrated) Topside

The OSP topsides may be shipped directly from the fabrication site to the Lease Area, or to a previously identified marshalling port (see Section 3.3.14) for storage, preassembly, and/or transportation to the installation site. It may be necessary for the OSP topsides to be transported to the quayside using a self-propelled modular transporter before being lifted onto a heavy transport vessel or barge. The topsides may be transported with or without its substructure on a single vessel, so one or two transportation campaigns may be utilized per OSP.

Depending on the amount of pre-assembly that will occur before the OSP topsides arrive to the installation site, OSP components could be installed by a few methods. OSP topside components could be placed on the substructure with a series of direct lifts from a heavy lift vessel or jack-up vessel. The entire OSP topsides could also be positioned over the substructure with a floating crane and subsequently lowered, as depicted in **Figure 3-18**. Finally, for a large OSP, the entire topside could be floated over a foundation. After placement of the topsides, fastening and welding operations could be carried out by crews accessing the structure by work vessels or via a walk to work (compensated gangway) system. Each substructure will have one or more boat landings with access to the topside via stairs.

SOURCE: DNV (2019)

FIGURE 3-18. EXAMPLE OF HEAVY LIFT VESSEL INSTALLING AN OSP

Electrical installation will commence after the mechanical installation is complete. Inter-array cables and the offshore export cables will be connected to their designated switchgear within the OSPs. Both the inter-array and export cables will be pulled through J-tubes located at the base of each substructure either before or after the topside has been installed. The OSP substructures will accommodate many flex J-tubes for inter-array cables to be installed through fewer, larger J-tubes for export cables. Section 3.3.4 and Section 3.3.5 describe inter-array and offshore export cable installation, respectively.

3.3.3.4.3 Option C (DC Converter) Topside

Option C, the DC Converter type of OSP could be placed on a jacket structure. As with Options A and B, this topside may be shipped directly from the fabrication site to the Lease Area, or to a previously identified marshalling port (see Section 3.3.14) for storage, preassembly, and/or transportation to the installation site. This OSP topside could also be integrated with the foundation and substructure as one unit. For this OSP type, the topside could be installed via a heavy lift vessel, jack-up vessel, floating crane, or floated over.

3.3.3.5 Operation and Maintenance (All Options)

The OSPs have been designed as normally unmanned installations. During normal operation, there will be no need for an operator to be present on the OSPs. O&M personnel will visit the site routinely for equipment inspections and to perform planned and unplanned maintenance activities, see **Table 3-11** for general list of O&M activities and timeframes. Each OSP will be equipped with safety devices that will facilitate safe and sustainable operation. During service calls, personnel will have access to the OSP's interior via marked access points for O&M procedures which are designed with all required safety specifications.

TABLE 3-11. INDICATIVE OSP O&M TASKS AND SCHEDULE

O&M Task	Inspection Cycle
Routine inspections	As required based on final OSP design a/
Maintenance of switchgear and equipment	Annually
Transformer oil sample and targeted maintenance	Every 3 years
Extended maintenance routines	Every 5 and 10 years
Unplanned maintenance	As needed

Note:
a/ As per manufacturer requirements

The OSPs will be equipped with monitoring and supervisory control and data acquisition systems that will allow for the remote monitoring and operation of the OSP on a 24 hour per day, 365 days per year basis. The remote monitoring, diagnostic, and operating systems will be employed to proactively identify onboard equipment failures and for support of unplanned maintenance activities. Even with remote monitoring systems in place, unplanned maintenance can occur that may involve repair or replacement of Project infrastructure. During a loss of power, an emergency generator may be used to keep the OSP's crucial components functional. Non-emergency uses of this generator may include start-up or use while idling.

Most maintenance activities will be minor in nature and will not require heavy construction equipment. On occasion, significant maintenance activities may need to occur that may require a jack-up vessel or transportation vessel on site.

3.3.3.6 Decommissioning (All Options)

SouthCoast Wind will disconnect, dismantle, and remove OSP topsides. To begin, all fluids will be properly drained, transported to shore, and safely recycled or disposed of as established by the decommissioning plan. Generally, OSP decommissioning activities will have similar environmental impacts as construction and installation activities.

Depending on the design, the entire OSP topside may be lifted and placed onto a transportation vessel, or major equipment from each OSP could be removed individually before the entire topside or structure is lifted. Heavy transport vessels or barges will then transfer OSP components ashore. Reusing and/or recycling the OSPs for scrap metal or other materials will the preferred method of disposal.

Decommissioning of the non-integrated substructures for the OSPs is addressed in Section 3.3.1.7.

3.3.4 Inter-Array Cables

The inter-array cabling system connects the WTGs to the OSPs through a series of submarine cables. Inter-array cables are arranged in strings and connect multiple WTGs to the OSP. The nominal inter-array cable voltage is between 60 kV and 72.5 kV. The final layout of the inter-array cables will be determined at a later date based on site characterization data, selected WTGs, cable capacity, and installation and operating conditions. For illustrative purposes, two indicative layouts are presented in **Figure 3-19** and **Figure 3-20**.

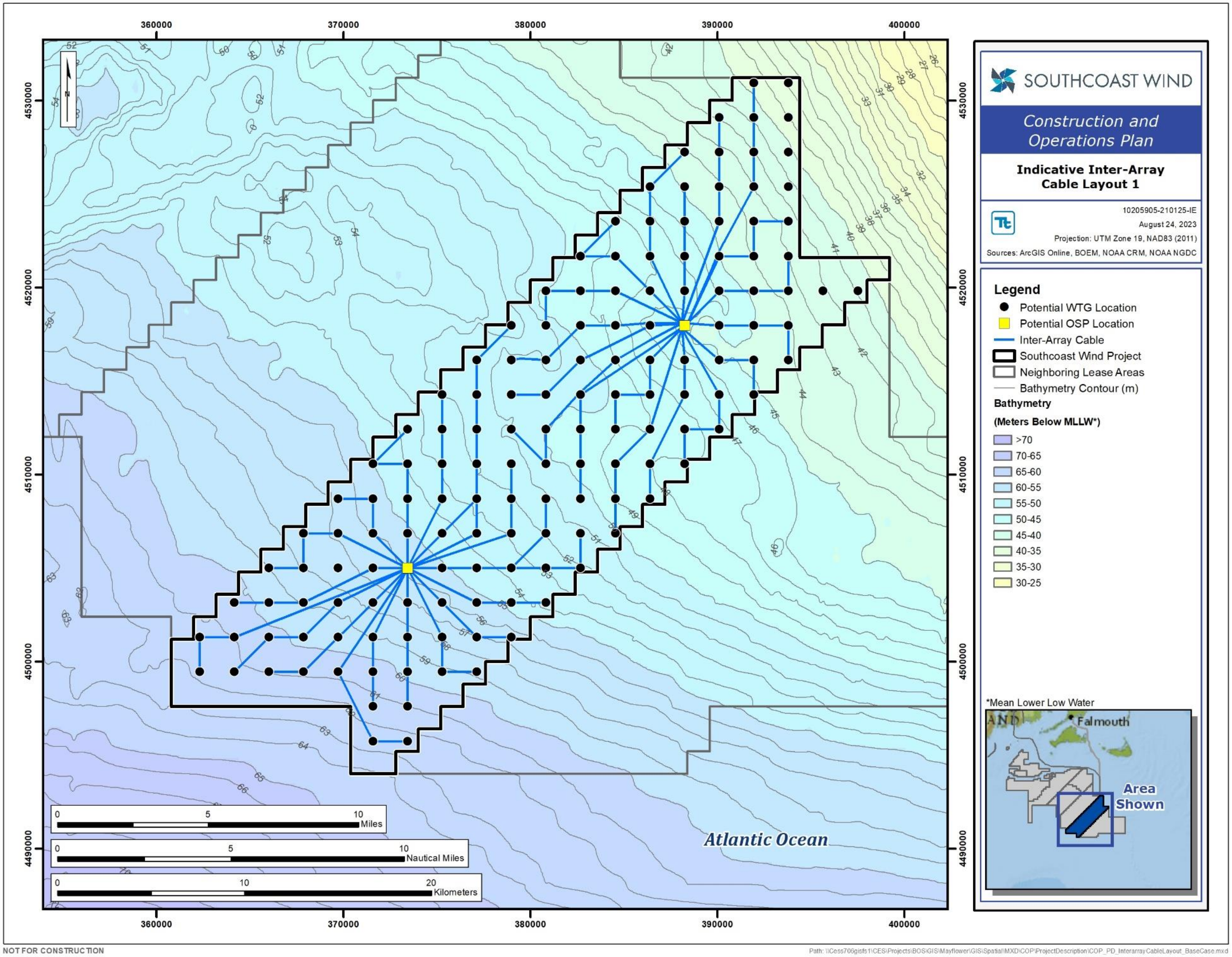


FIGURE 3-19. INDICATIVE INTER-ARRAY CABLE LAYOUT 1

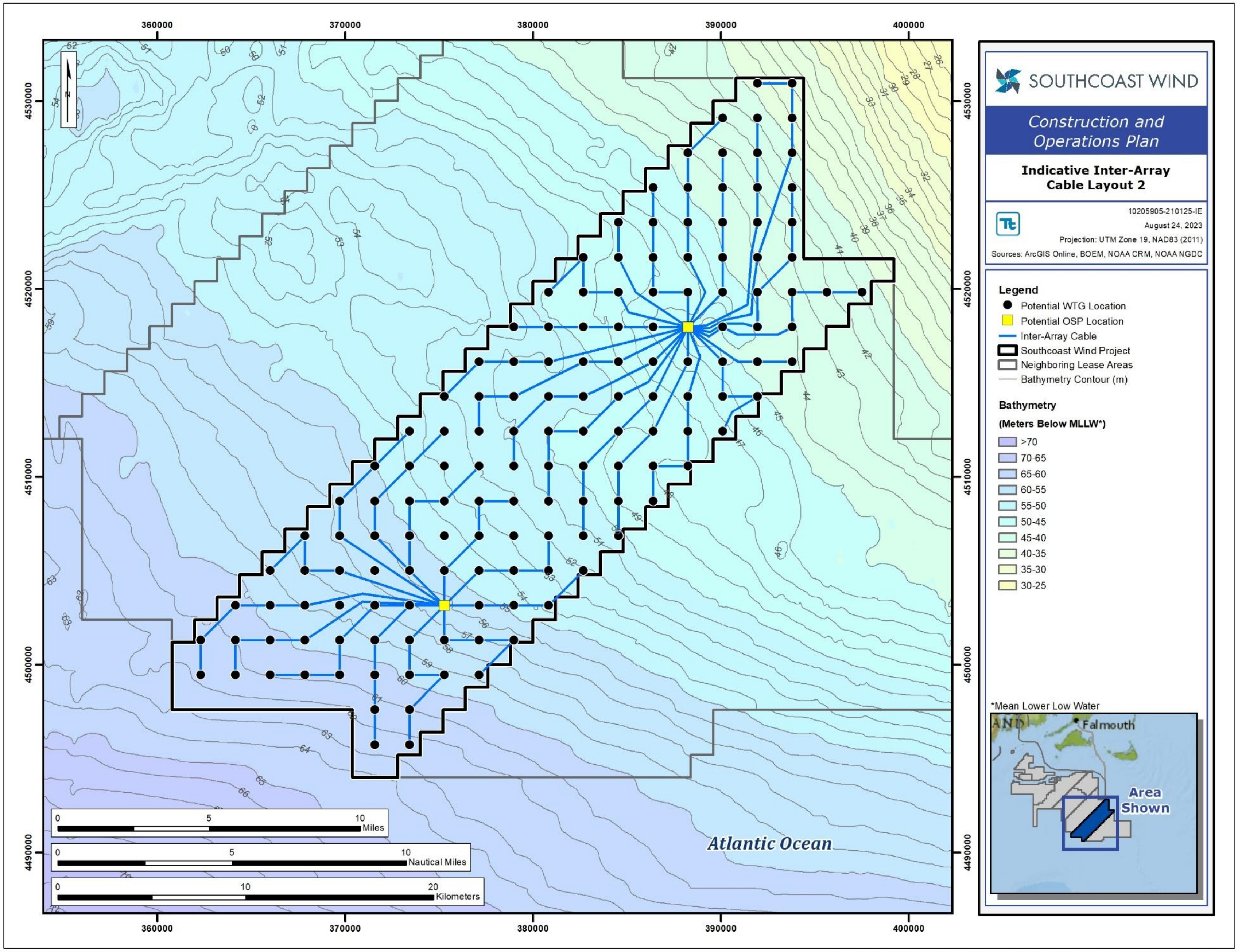


FIGURE 3-20. INDICATIVE INTER-ARRAY CABLE LAYOUT 2

The proposed inter-array cable is a three-core (three separate conductors/cores) armored submarine cable. The power cores will be either an aluminum or copper stranded conductor with a cross-linked polyethylene insulation system, copper wire screen with lead sheath (or aluminum foil or copper tape screen), and polyethylene over-sheath. Filler material in the cable may be extruded polyethylene or polypropylene yarns. Each cable will contain a stainless-steel tube that houses and protects the fiber optic cable, the stainless-steel tube is coated with a polyethylene jacket. **Figure 3-21** depicts the proposed Project's inter-array cable cross section.

The power core fillers and fiber optic tube are covered with armor bedding and galvanized or stainless-steel wire armor outer jacket, which will be polypropylene yarns soaked in bitumen. Where the cable exits from the WTGs substructures and J-tubes, additional external metal or polyethylene sheathing is likely to be used to maintain the required bend radius and protect the cable. **Table 3-12** presents the minimum and maximum parameters of the inter-array cable design and layout under consideration.

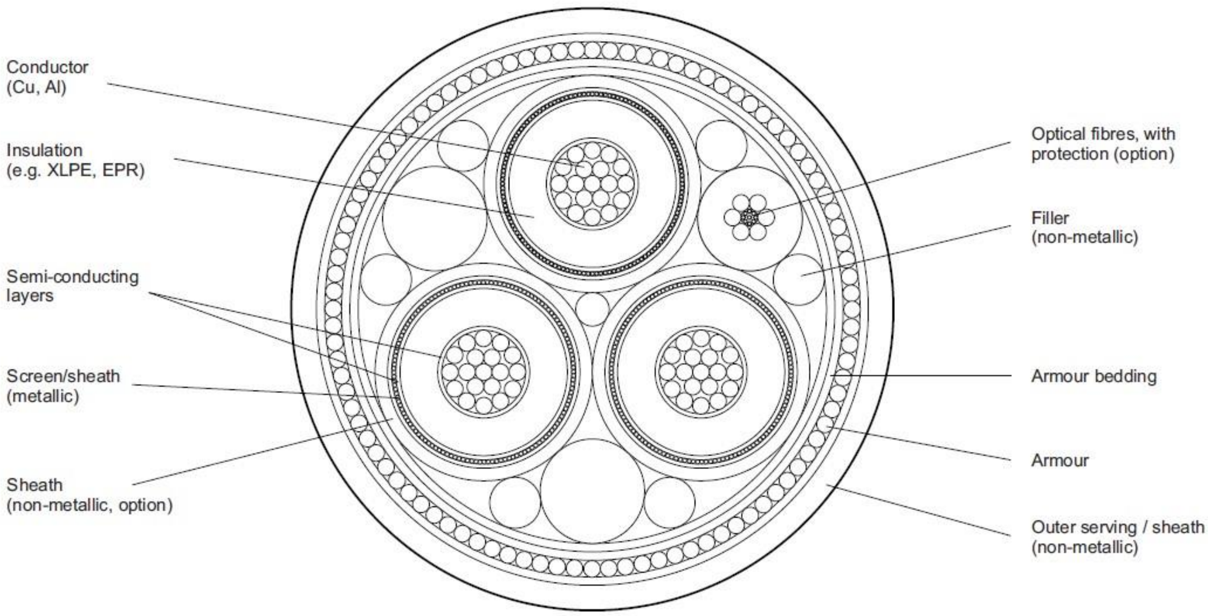


FIGURE 3-21. INTER-ARRAY CABLE CROSS SECTION

TABLE 3-12. INTER-ARRAY CABLE PARAMETERS

Inter-Array Cable Parameter	Minimum	Maximum
Cable Diameter	0.20 in^2 (130 mm^2)	1.24 in^2 (800 mm^2)
Nominal Cable Voltage (AC)	60.0 kV	72.5 kV
Cable Length	124.3 mi (200 km)	497.1 mi (800 km)
Anticipated Cable Burial Depth (below level seabed) (Target Burial Depth = 6 ft [1.8 m])	3.2 ft (1.0 m)	8.2 ft (2.5 m)
# of WTGs Per Inter-Array Cable String	1	9
# of Cable Conductor Cross Sections (sizes)	1	6
Cable or Pipeline Crossings	0	10
IAC Load Current	—	900 A

3.3.4.1 Construction and Installation

Inter-array cables provide a route for generated power to flow from each WTG to the OSP. As discussed above, aluminum and/or copper-conductor core inter-array cables will connect the WTGs to the OSP. The expected sequence and methodology of inter-array cable installation is presented below.

3.3.4.1.1 Cable Lay Preparation

Cable Installation Survey Prior to construction, one or more pre-installation surveys of the cable routes will be conducted. This survey will utilize sonar, sub bottom profiler, echo-sounder, and/or magnetometer to create images and collect data on features present on the seafloor and within the subsurface. These surveys will further inform installation and protection methods to be applied to the inter-array cables and aid in avoiding potential seafloor and subsurface hazards. More information on the seafloor and subsurface character of the Lease Area is included in Section 4 and Appendix E, Marine Site Investigation Report.

Pre-installation surveys of the cable routes will serve to validate the seabed conditions (including but not limited to validating the presence of debris/obstructions and as-built position of existing infrastructure).

Seafloor Preparation Any boulders discovered in the cable route in pre-installation surveys that cannot be easily avoided by micro-routing could be removed with a grab lift or plow as necessary. If deemed necessary, a pre-lay grapnel run will be conducted to clear the cable route of buried hazards along the installation route to remove obstacles that could impact cable installation such as abandoned mooring lines, wires, or fishing equipment.

The typical maximum size boulder that can be removed by the proposed methods is 3 m (9.8 ft) in diameter. The actual boulder size that can be removed will depend on specifics of the boulder, including shape, weight, embedment, and surrounding seabed conditions. Site-specific conditions will be assessed prior to any boulder removal to ensure that the boulder removal can safely proceed.

3.3.4.1.2 Cable Transportation, Installation, and Burial

Transportation of inter-array cables will occur via carousel- or static tank-equipped cable-lay vessel, dedicated cable transportation vessel, or a combination of these options. The number of campaigns will depend on vessel size, type, and capacity.

Inter-array cables are planned to be laid and buried in continuous lengths between structure pull-ins. Installation of any required protection at the cable ends is typically completed prior to cable installation from the vessel. The pre-installation surveys and subsequent site characterization will determine the most appropriate method of cable installation for the seafloor and subsurface conditions present and confirm the target burial depth. The water depth at installation sites will necessitate use of a DP vessel.

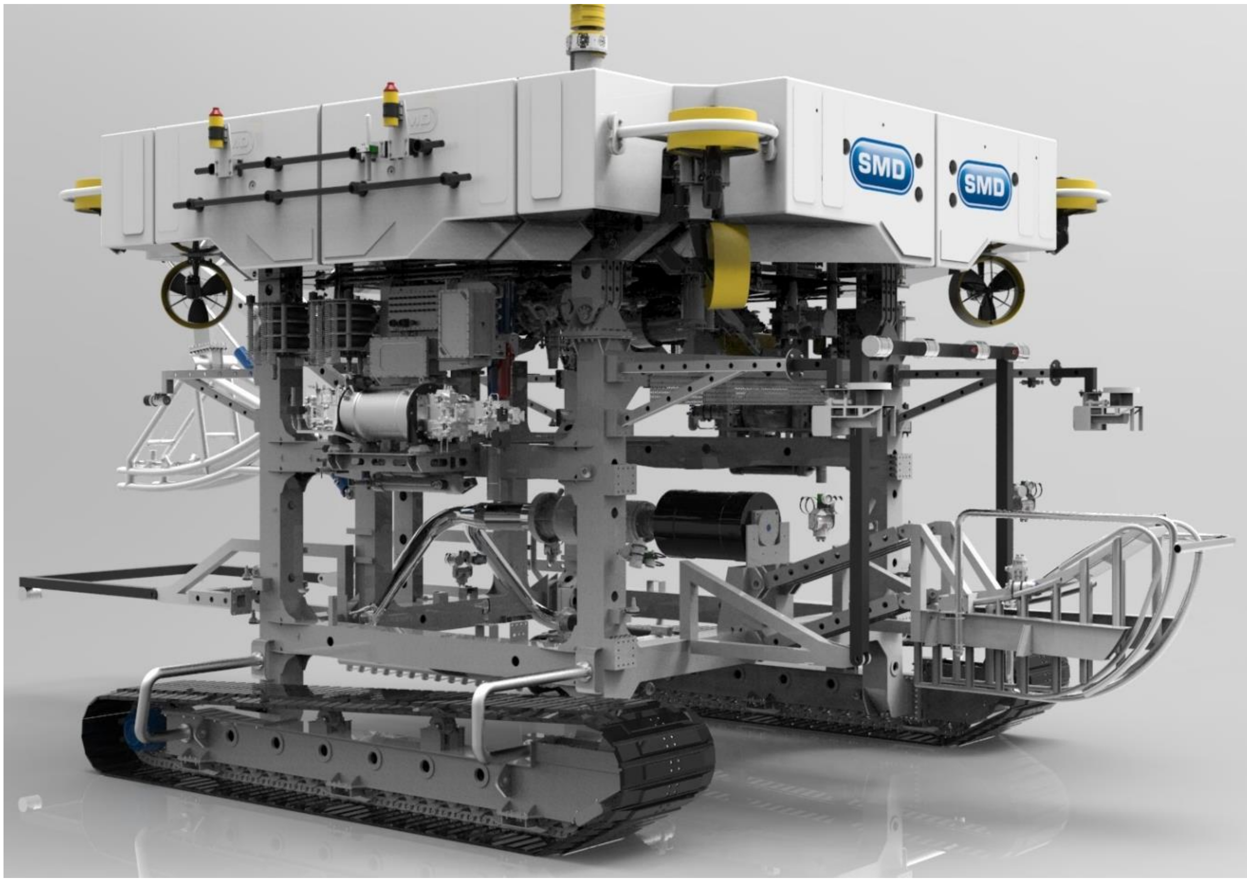
Inter-array installation methods are similar to the methods used for the offshore export cable installation and burial and may include a combination of those listed in **Table 3-13**. A description of these tools can be found in Section 3.3.5.4. These cable laying techniques can involve pre-laid or simultaneous cable installation. A boulder clearing plow and a jetting ROV are shown in **Figure 3-22** and **Figure 3-23**, respectively.

TABLE 3-13. INTER-ARRAY CABLE INSTALLATION AND BURIAL EQUIPMENT

Equipment	Use
Jetting ROV	Can be used for unconsolidated soft beds
Pre-cut plow	Any depth and can be used for hard bottoms
Mechanical plow	Any depth and can be used for hard bottoms
Mechanical cutting ROV system	Any depth; used for hard, consolidated substrate

Source: SMD, 2016

FIGURE 3-22. EXAMPLE OF BOULDER CLEARING PLOW



Source: SMD, 2016

FIGURE 3-23. EXAMPLE OF JETTING ROV

3.3.4.1.3 Secondary Cable Protection

Cable protection methods vary depending on the pre-installation survey findings, contractors' preferences and the vessels used for the cable installation. Cable protection is typically required at any existing cable crossing location and for areas that are unable to achieve the target burial depth. Based on preliminary understanding of site conditions from surveys completed in 2019 and 2020, SouthCoast Wind estimates 10 percent of the inter-array cable layout will require additional cable protection. The cable protection methods will be determined based on the location, length, extent of the non-burial, and when all remedial burial solutions have been ruled out. These secondary cable protection methods may include the creation of a rock berm, concrete mattress placement, rock placement, and fronded mattresses (See Section 3.3.1.9 for additional information on fronded mattresses). Half shells may be used as well, and they are typically used to protect cables ends at pull-in areas and where trenching is not possible.

Any required crossings of other Project cables or existing third-party cables by the inter-array cables will utilize mutually agreeable crossing designs consistent with typical industry practices, which typically employ use of concrete mattresses (though other crossing methods may be assessed for use). Minimum separation distances will be determined so that both cables can be safely operated with risk of damage to either cable mitigated to the extent practicable. An example of a concrete cable protection mattress is provided in **Figure 3-31**.

3.3.4.2 Operation and Maintenance

The inter-array cables are buried and not expected to require regular maintenance, except for manufacturer-recommended cable testing. Periodic visual inspections of the inter-array cables will be planned based on survey data and manufacturer recommendations based on the as-built drawings. Planned outages are not expected for the periodic inspections.

3.3.4.3 Decommissioning

Inter-array cables may be retired in place or removed, as per 30 CFR § 285.909. Cable protection measures, such as concrete mattresses or rocks, could be removed before any cable recovery activities. If removed during decommissioning, the cables will be disconnected and pulled out of the J-tubes before being extracted from the seabed. Dredging vessels may be used to unearth the cables before the cable may be reeled onto barges or other transport vessels.

3.3.5 Offshore Export Cables

The proposed Project will include up to two offshore export cable corridors, the Falmouth export cable corridor and the Brayton Point export cable corridor. Within the Falmouth export cable corridor, up to five offshore export cables, including up to four power cables and up to one dedicated communications cable, will connect the OSPs to the landfall site in Falmouth. For transmission of the proposed Project's power to shore within the Falmouth export cable corridor, a nominal voltage between 200 and 345 kV has been identified as most suitable for SouthCoast Wind. Within the Brayton Point export cable corridor, up to six offshore export cables, including up to four power cables and up to two dedicated communications cables, will connect the OSPs to the landfall site at Brayton Point. For transmission within the Brayton Point export cable corridor, a nominal voltage of ±320 kV has been identified as most suitable for SouthCoast Wind. The two offshore export cable corridors are shown in **Figure 3-24**.

3.3.5.1 Transmission Technology and Cable Design

SouthCoast Wind is considering two electric power transmission technologies for the proposed Project, HVAC and HVDC. The Falmouth export cables will be either HVAC or HVDC and the Brayton Point export cables will be HVDC.

3.3.5.1.1 HVAC Transmission Technology

HVAC uses alternating current waveform for bulk transmission of power. An HVAC system for offshore wind transmission requires step-up at each end of the transmission circuits. One end of the transmission system will be the OSPs within the Lease Area. The OSPs will step up the power from the WTG array voltage for long distance transmission, see Section 3.3.3. The onshore substation will then transform the power to 345 kV for input to the existing ISO-NE grid system, see Section 3.3.8 and Section 3.3.11.

Within the Falmouth export cable corridor, the transmission export circuits will consist of up to four power cable circuits, plus up to one associated communications cable. Offshore, there may be up to four power cables, one for each circuit, with each containing three conductors. Just inland from cable landfall in Falmouth, the offshore three-core cables are split out into three separate single-core cables, with up to twelve onshore export cables in total, plus associated communications cables.

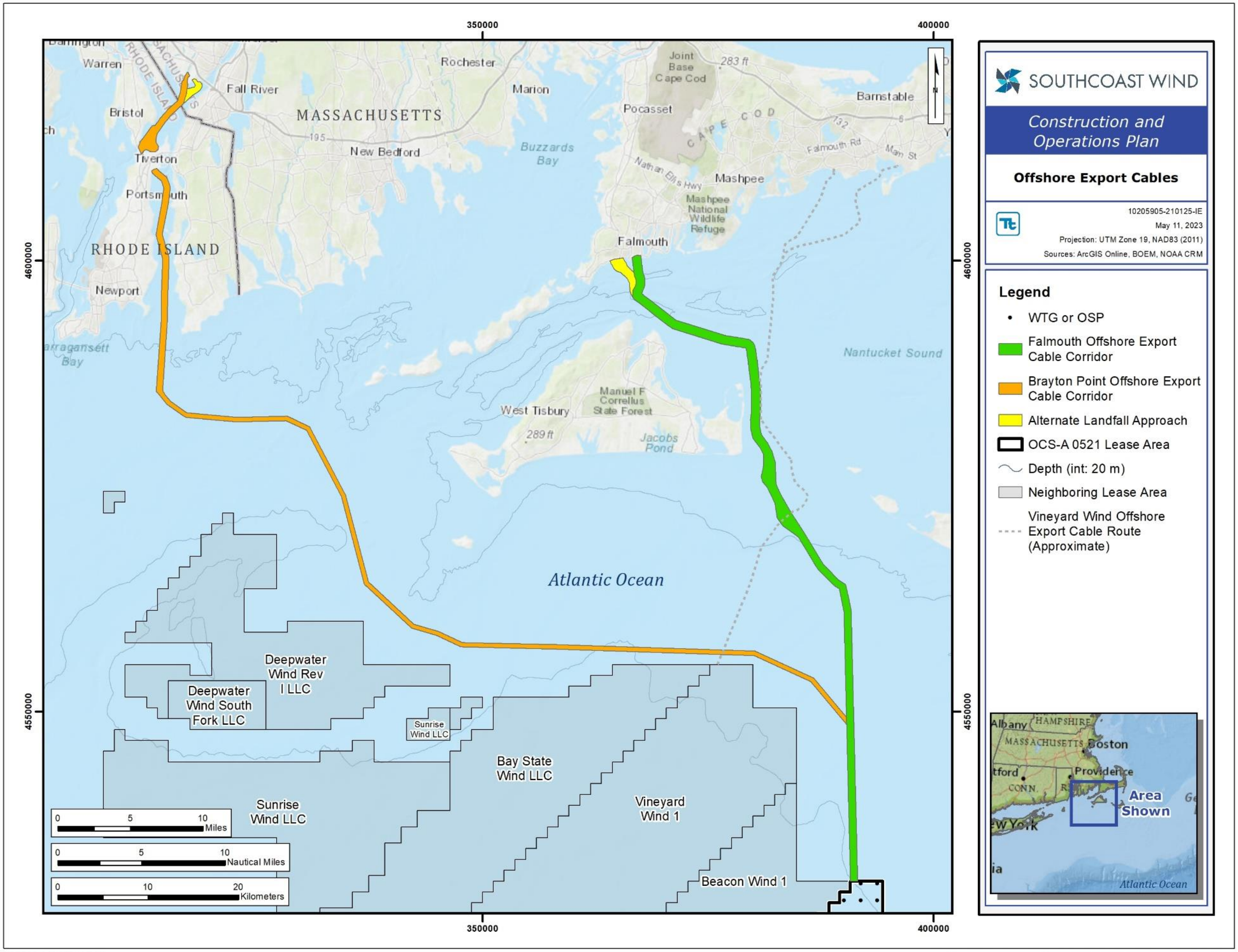


FIGURE 3-24. OFFSHORE EXPORT CABLE CORRIDORS

3.3.5.1.2 HVDC Transmission Technology

HVDC is an electric power transmission technology that uses direct current instead of alternating current waveform for bulk transmission of power. The subset of HVDC technology suitable for offshore wind farm application is Voltage Source Converter modular multilevel converter technology.

Within the Brayton Point export cable corridor, for the transmission of the proposed Project’s power to shore, a voltage of up to ±320 kV will be utilized with HVDC. The transmission system will require up to six single-core power cables plus up to two associated dedicated or integrated communications cables. One power cable can be operated at up to 320 kV and the other at -320 kV, both relative to ground voltage, with the other two cables providing a neutral return path. The nominal voltage for the HVDC cables within the Brayton Point export cable corridor is ±320 kV. The cables will be installed in a bundled configuration where practicable. Unlike HVAC technology, the voltage of the cables remains constant at these magnitudes. The current through the cables is also a constant waveform but varies in magnitude depending on the amount of power being transmitted, and therefore will vary with wind farm production.

An HVDC system requires converters at each end of the transmission circuit. A converter station (or stations) will be located on the OSPs within the Lease Area. This converts and transforms the power from a lower AC voltage to higher DC voltage. The other converter stations would be at Brayton Point, in Somerset, Massachusetts. They will convert the power from DC to 345 kV AC for input into the existing ISO-NE grid system at the Brayton Point POI.

Cable Design Each HVAC offshore export power cable will be a three-core (three power cores) armored submarine cable, as depicted in **Figure 3-25**. The power cores are either aluminum or copper stranded conductor, with cross-linked polyethylene insulation, lead sheaths, and polyethylene oversheath. Filler material in the cable may be extruded interstitial fillers, extruded polyethylene, or polypropylene yarns. Each cable will contain a stainless-steel tube coated with a polyethylene jacket that houses and protects the fiber optic cable. The power cores, fillers, and fiber optic tube are covered with armor bedding and galvanized or stainless-steel wire armor. The outer serving will be polypropylene yarns soaked in bitumen.

Each HVDC offshore export power cable will be a single-core (one power core) armored submarine cable, as depicted in **Figure 3-26**. The power core will be either aluminum or copper stranded conductor, with cross-linked polyethylene insulation, a lead sheath, a polyethylene oversheath. The cable will be covered with galvanized, stainless-steel wire armor, and an outer serving of polypropylene yarns soaked in bitumen. Fiber optic wires may be embedded within the armor layer of the cable. The HVDC cables will be installed a bundled configuration where practicable, with each cable bundle consisting of two power cables and one dedicated communications cable.

Cable parameters for both HVAC and HVDC offshore export cables is provided in **Table 3-14**.

TABLE 3-14. OFFSHORE EXPORT CABLE PARAMETERS

Offshore Export Cable Parameter	Falmouth ECC Minimum	Falmouth ECC Maximum	Brayton Point ECC Minimum	Brayton Point ECC Maximum
Number of Cables	1	5	1	6 b/
Cable Diameter a/	—	13.8 in (350.0 mm)	—	6.9 in (175.0 mm) b/
Nominal Cable Voltage	200 kV (±525 kV if HVDC)	345 kV c/ (±525 kV if HVDC)	±320 kV	±320 kV
Length of Offshore Export Cable Corridor	51.6 mi (83.0 km)	87.0 mi (140.0 km)	97 mi (156 km)	124 mi (200 km)
Cable Length	51.6 mi (83.0 km)	434.9 mi (700 km)	97 mi (156 km)	744 mi (1200 km)
Cable Corridor Width	—	3,280.8 ft (1,000 m)	—	2,300 ft (700 m)
Number of cable crossings	0	9	0	16
Anticipated Cable Burial Depth (below level seabed) (Target Burial Depth = 6 ft [1.8 m])	3.2 ft (1.0 m)	13.1 ft (4.0 m)	3.2 ft (1.0 m)	13.1 ft (4.0 m)
Approximate Cable Load Current b/	—	1200 A	—	2000 A
# of Cable Conductor Cross Sections (sizes)	1	4	1	4

Notes:
a/ This value excludes cable protection
b/ The cables will be installed in up to two cable bundles, each consisting of two power cables and one dedicated communications cable, where practicable. Maximum cable bundle width is twice the maximum cable diameter.
c/ The maximum rated cable voltage is up to 362 kV.

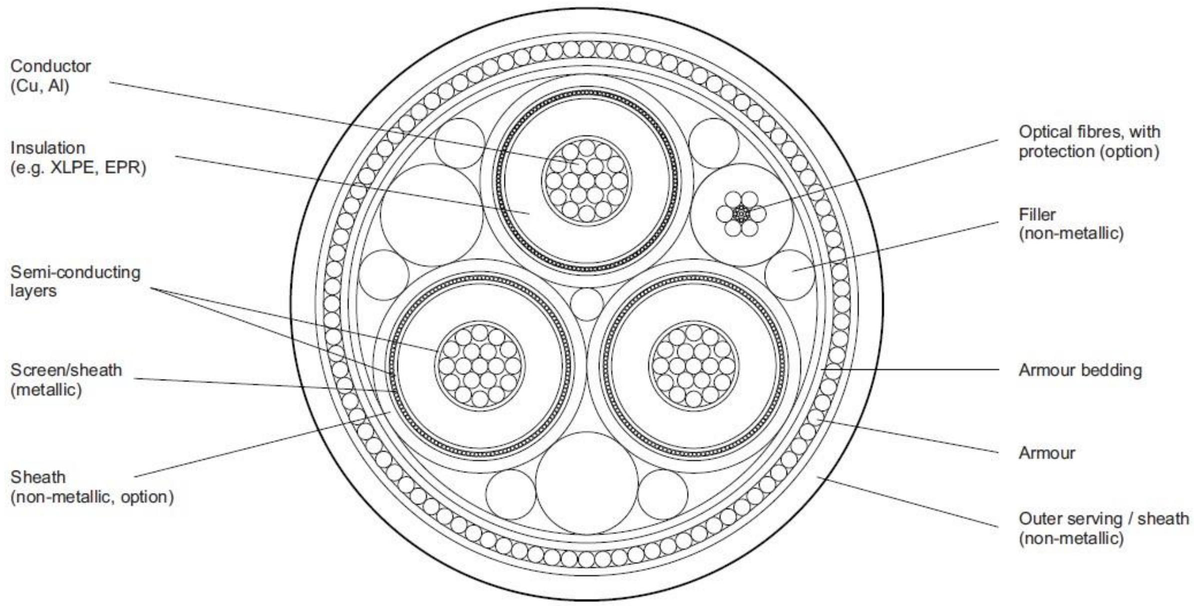


FIGURE 3-25. OFFSHORE EXPORT CABLE CROSS SECTION (HVAC)

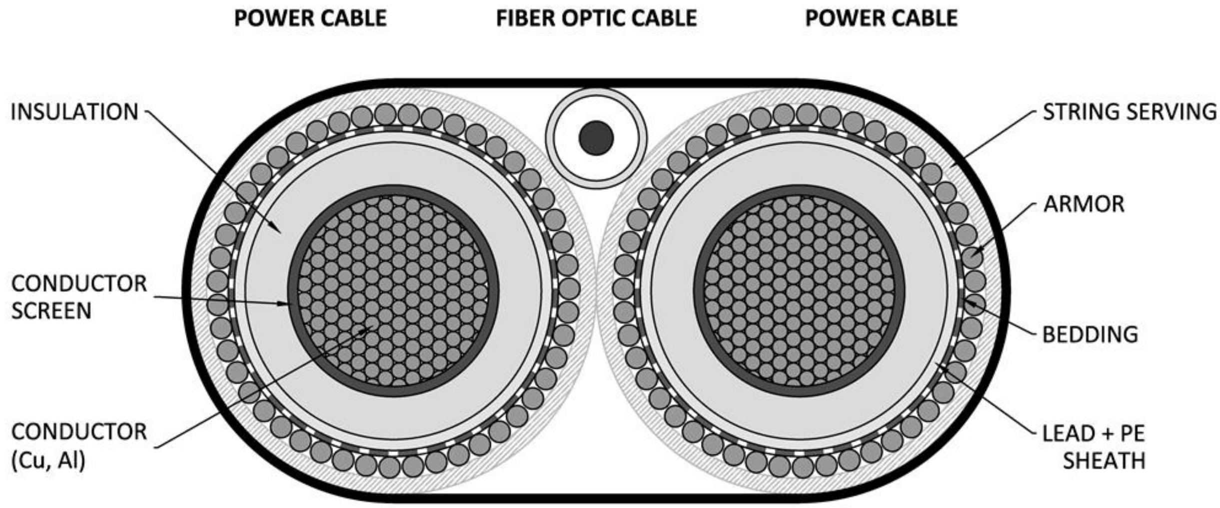


FIGURE 3-26. INDICATIVE OFFSHORE EXPORT CABLE BUNDLE CROSS SECTION (HVDC)

3.3.5.2 Cable Route and Cable Crossings

The proposed export cable routes include the Falmouth export cable corridor, which starts from the OSPs within the Lease Area and extends northward through Muskeget Channel, and then turns northwest to the landfall site in Falmouth, Massachusetts. The Brayton Point export cable corridor starts from the OSPs within the Lease Area and extends northwest through Rhode Island Sound to the Sakonnet River. The Brayton Point export cable corridor then extends northward until making intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island for a brief underground onshore export cable route section, then into Mount Hope Bay and to Brayton Point. The export cable corridors are shown in **Figure 3-24**.

SouthCoast Wind intends to maintain an export cable corridor width of between 2,625 ft (800 m) and 3,280 ft (1,000 m) for the Falmouth export cable corridor, and between 1,640 ft (500 m) to 2,300 ft (700 m) for the Brayton Point export cable corridor, to allow for maneuverability during installation and maintenance. The offshore export cable corridors may be locally narrower or wider to accommodate sensitive locations and to provide sufficient area at landfall locations, at crossing locations, or for anchoring.

Cable crossings are expected to be required. At each crossing location, one or more cables may be crossed by the proposed Project's offshore export cables, for an anticipated total of up to nine cables to be crossed by the Falmouth export cable corridor, and up to 16 cables and pipelines to be crossed by the Brayton Point export cable corridor, as explained in **Table 3-15** and shown in **Figure 3-27**. The first of the Falmouth export cable corridor proposed crossing areas will be near Muskeget Channel with the potential for one other cable crossing area, situated between Martha's Vineyard, Massachusetts and Falmouth, Massachusetts, if Falmouth is the selected POI for Project 2. The nearshore cable crossings will be determined by the selected landfall location in Falmouth, Massachusetts. For the Brayton Point export cable corridor, up to 13 crossings of planned cables are expected to occur south of the Muskeget Channel, south of Nomans Island, and south of the Sakonnet River. Two charted pipeline areas have been identified within the Sakonnet River. SouthCoast Wind will coordinate with the owners of the cables and pipelines listed below, and any other unanticipated cable or pipeline crossings not identified, to agree on detailed cable crossing design, installation, and maintenance requirements. Cable crossing design will be determined by the cable crossing's proximity to shore and the third-party crossing agreement requirements. Minimum separation distances will be determined so that both cables can be safely operated with risk of damage to either cable mitigated to the extent practicable.

TABLE 3-15. PROPOSED CABLE/PIPELINE CROSSINGS

Cable Description	Number of Cables/Pipelines to be Crossed	Location	Offshore Project Area
Potential Crossing Area A	Up to 2 existing cables	Between Martha's Vineyard and Falmouth (cables make landfall at Shore St in Falmouth)	Falmouth export cable corridor (ECC)
Potential Crossing Area B	Up to 7 planned cables a/	South of Muskeget Channel	Falmouth ECC
Potential Crossing Area C	Up to 7 planned cables a/	South of Muskeget Channel	Brayton Point ECC
Potential Crossing Area D	Up to 4 planned cables	South of Nomans Land	Brayton Point ECC
Potential Crossing Area E	Up to 2 planned cables b/	South of Sakonnet River	Brayton Point ECC
Potential Crossing Area F	1 existing pipeline	Sakonnet River (charted Pipeline Area)	Brayton Point ECC
Potential Crossing Area G	2 existing pipelines	Sakonnet River (charted Pipeline Area)	Brayton Point ECC

Notes:
a/ Vineyard Wind
b/ Bay State Wind (up to 2 planned)

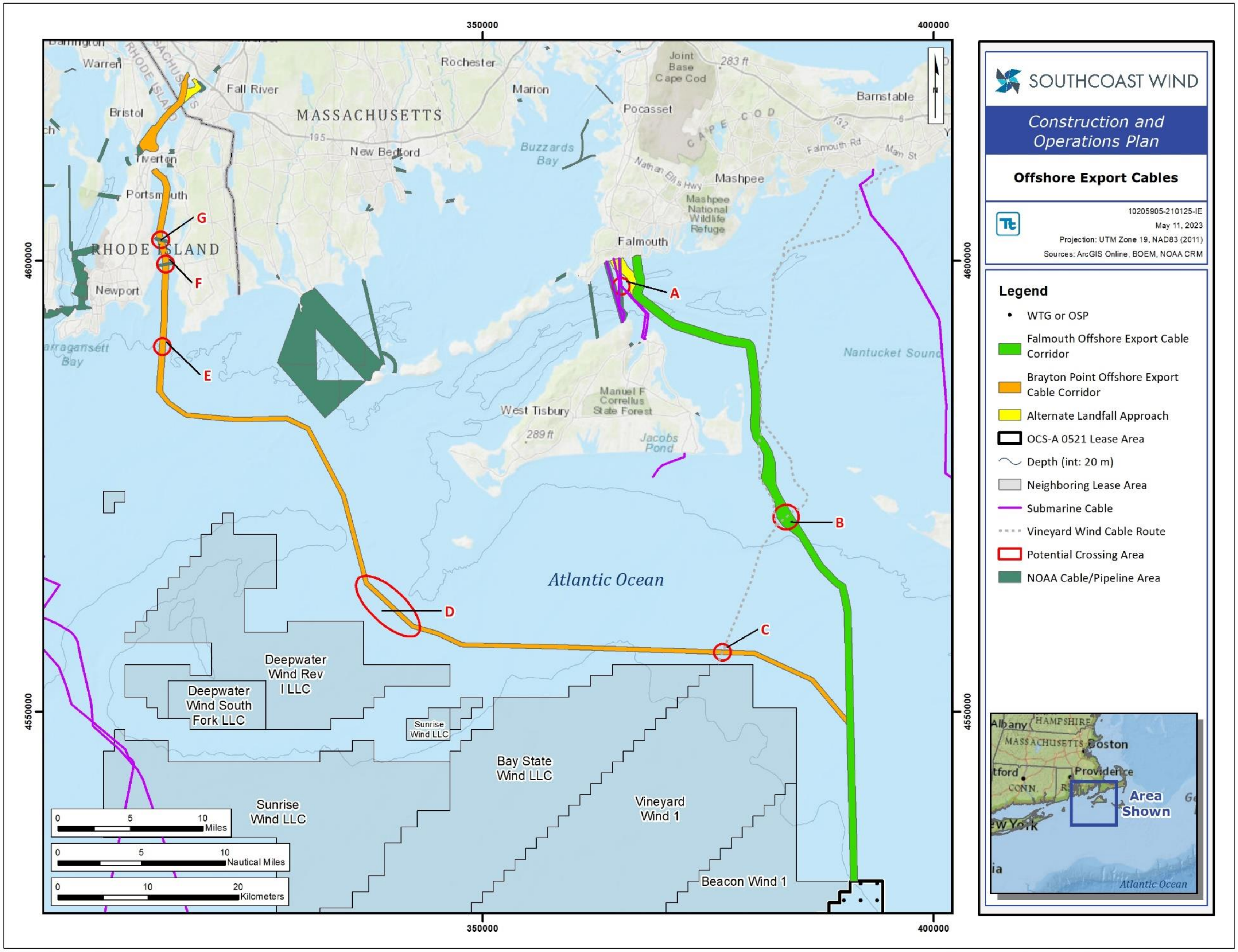


FIGURE 3-27. POTENTIAL CABLE AND PIPELINE CROSSINGS

3.3.5.3 Cable Lay Preparation

Cable Installation Survey Prior to installation of the export cables, surveys will be conducted utilizing a range of sensors ranging from sonar, sub-bottom profiler, echo-sounder, and magnetometer. Some surveys will take place years in advance of the cable installation campaign to determine the optimal installation method. Additional survey data will likely be collected immediately before installation to identify any anomalies or changes from prior surveys (such as fishing gear, boulders, or mobile sand waves) for the vessels and installation team. These surveys assist in building a framework for the seafloor and subsurface along the export cable route and highlight areas requiring pre-lay route preparation.

Seafloor Preparation Any boulders discovered in the cable route in pre-installation surveys that cannot be easily avoided by micro-routing could be removed with a grab lift or plow as necessary. If deemed necessary, a pre-lay grapnel run will be conducted to clear the cable route of buried hazards along the installation route to remove obstacles that could impact cable installation such as abandoned mooring lines, wires, or fishing equipment. SouthCoast Wind may utilize equipment, as detailed in **Table 3-16**, to level the seabed locally in order to use seabed-operated cable burial tools and ensure consistent burial is achieved.

The typical maximum size boulder that can be removed by the proposed methods is 3 m (9.8 ft) in diameter. The actual boulder size that can be removed will depend on specifics of the boulder, including shape, weight, embedment, and surrounding seabed conditions. Site-specific conditions will be assessed prior to any boulder removal to ensure that the boulder removal can safely proceed.

TABLE 3-16. SEABED PREPARATION EQUIPMENT

Equipment	Use
Grapnel plow	Pre-lay grapnel run
Orange peel grabber	Localized boulder removal
Boulder clearance plow	Boulder field clearance
Trailing suction hopper dredger	Removal of sand wave tops
Water injection dredge dredger	Removal of sand wave tops in shallow areas
Constant flow excavator	Seabed leveling and preparation

3.3.5.4 Cable Transportation, Installation, and Burial

Transportation of the export cables will occur via carousel-equipped cable-lay vessel (as depicted in **Figure 3-28**), dedicated cable transportation vessel, or a combination of these options. The number of campaigns will depend on vessel size, type, and capacity, and the cable type, length, and number of cable joints required. It is anticipated that one or more cable joints will be required in each export cable due to the export cable route length.

Depending on the survey findings and seabed conditions encountered, several preparation and installation methods may be utilized. These methods are listed in **Table 3-17** and described below. These cable laying techniques can involve cable pre-installation followed by burial and/or simultaneous cable installation and burial.

Source: Jan De Nul, 2020

FIGURE 3-28. EXAMPLE OF A CABLE LAYING VESSEL

TABLE 3-17. OFFSHORE EXPORT CABLE INSTALLATION AND BURIAL EQUIPMENT

Equipment	Use
Vertical injector	Vessel mounted burial solution for shallow water use that does not require seabed/sand wave sea leveling
Jetting sled	Shallow water uses for deeper trench depths (surface fed water supply) in areas of prepared/benign seabed surfaces
Jetting ROV	Typically used in deeper water and can be used for unconsolidated soft beds
Pre-cut plow	Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays)
Mechanical plowing	Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays)
Mechanical cutting ROV system	Any depth, used for hard, consolidated substrate

Vertical Injector A vertical injector is a deep burial jetting tool used for cable installation and burial. The vertical injector uses water propelled from jet nozzles to fluidize the seabed material to allow for lowering of the cable. This tool is towed along the back of a vessel and acts as a trowel creating a space for the cable to be installed and subsequently buried. This burial solution does not generally require seabed leveling in areas of sand waves or similar mobile sediment features. Hanging from the cable installation barge, this trenching system is one of the few options that does not require a level seabed and is therefore capable of trenching in areas of large sand waves.

Jetting Sled A jetting sled possibly used along the export cable route, is towed from a vessel and can be launched either during post-lay trench mode or fitted with the cable to simultaneously create a trench through soft seabed material and lay the cable. The trench is created by water jetting through unconsolidated, softer seabed material. As such, jetting is optimal in unconsolidated soils and sands with low shear strengths. The trenching systems suffices for any curves that an offshore export cable may be laid in.

Jetting ROV This jet trencher is an ROV based system that can be launched from cable installation vessels or from a dedicated support vessel and is depicted in **Figure 3-23**. as the equipment is capable of lowering the cable to depths of up to 9.8 ft (3.0 m). This method is typically used in non-consolidated soils. It is typical that approximately 6.5 ft (2.0 m) of seabed width is affected by the use of a jet trencher.

Pre-Cut Plow This method is deployed when surface and sub-surface boulders are present. A basic mechanical plow will pre-cut a V-shaped trench ahead of cable installation. This allows for the boulders and soils to be lifted to the edges of the trenches for backfill purposes later. Once the cable is laid into the trench, the plow is re-configured into backfill mode where the boulders and soils that were previously relocated are then re-deposited.

Mechanical Plowing A mechanical plow is towed from the back of a vessel and simultaneously cuts a narrow trench in the seafloor, while also simultaneously laying and burying cable. Plowing capability can increase from firm unconsolidated soils/sands to more consolidated soils and clays with medium shear strengths.

Mechanical Cutting ROV System A mechanical cutting ROV cable burial system is a self-propelled system most suitable for soil with increased strength. This system can be utilized at any water depth. The mechanical cutting ROV system utilizes a cutting wheel or chain to break up and excavate any material. Used only in hard, consolidated soils; a rotating chain or cutting wheel with dedicated teeth will excavate the soil from beneath the cable and various systems will be required to displace this soil away for the trench allowing the cable to be lowered to depth.

Anchoring It is expected that a combination of a moored vessel solution and a DP vessel solution will be used for the offshore export cable installation. The split between vessels will be determined based on the water depth profile along the route and the route length compared to cable-carrying capacity. A DP vessel maintains its position and heading by utilizing its own propellers and thrusters. For water depths greater than 49.2 ft (15.0 m), it is expected that a DP vessel can be used. Nearshore areas and areas with shallow water less than 49.2 ft (15.0 m) may necessitate a moored vessel solution, as operation of vessel thrusters is typically not realistic in these water depths. See **Figure 3-29** and **Figure 3-30** for potential anchoring areas along the Falmouth and Brayton Point export cable corridors. The maximum anchor radius from the cable installation barge will be approximately 2,625–3,281 ft (800 -1,000 m) based on the anchor line length. This maximum radius will be forward and aft of the barge and will not extend outside of the width of the export cable corridors. It is anticipated that anchoring will only occur along approximately 12–25 mi (20–40 km) of the nearshore export cable corridors.

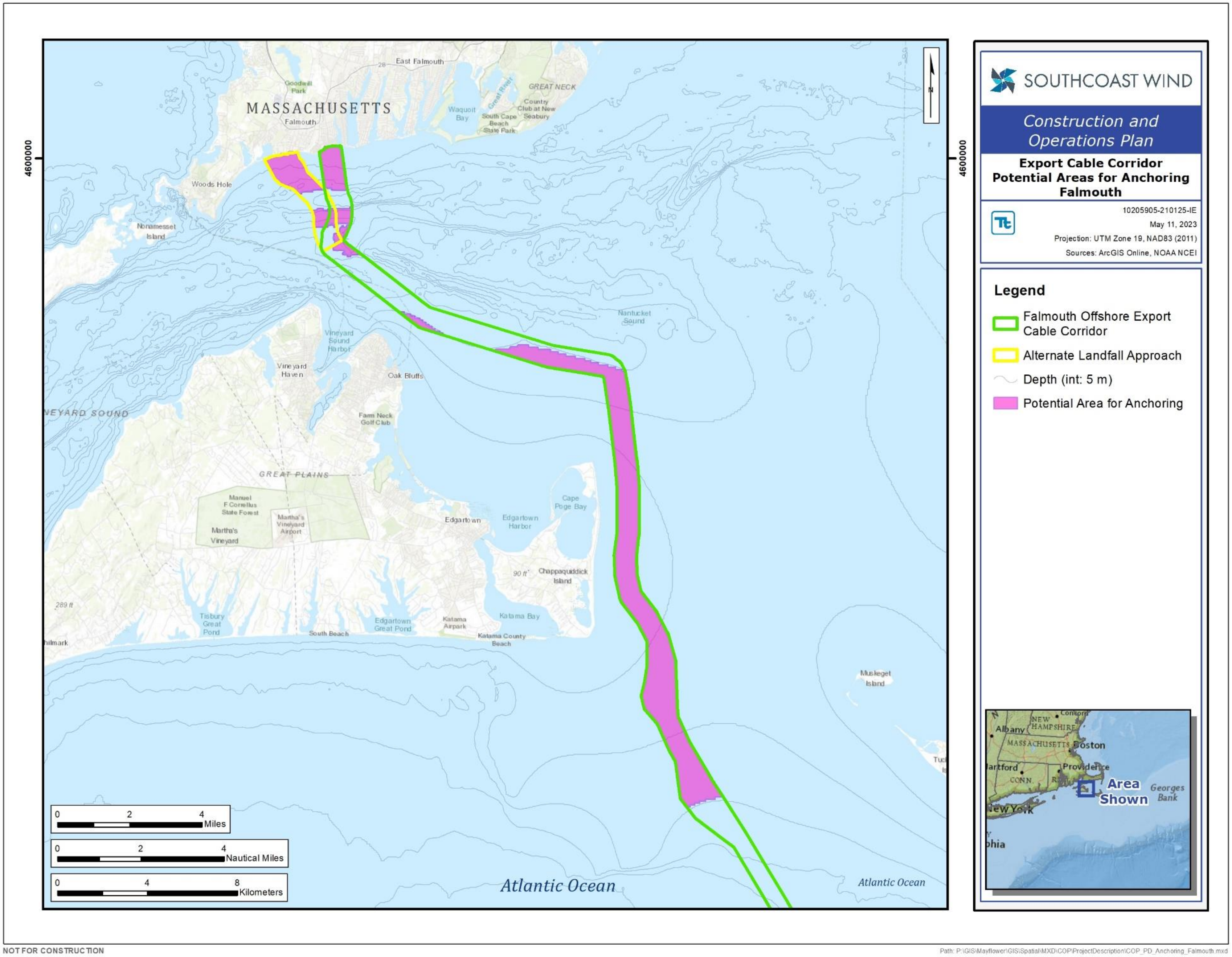


FIGURE 3-29. POTENTIAL AREAS FOR ANCHORING INSIDE FALMOUTH EXPORT CABLE CORRIDOR

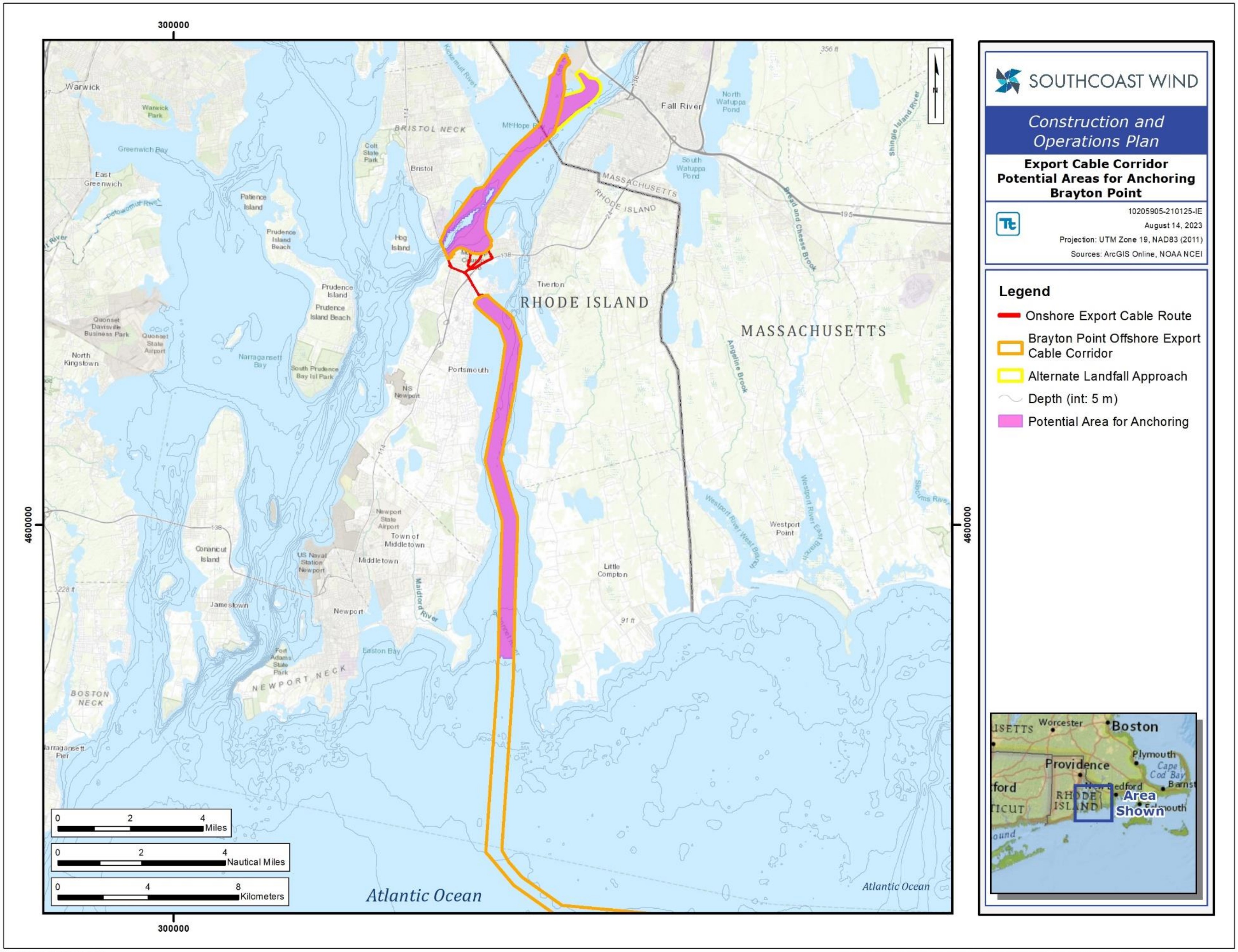


FIGURE 3-30. POTENTIAL AREAS FOR ANCHORING INSIDE BRAYTON POINT EXPORT CABLE CORRIDOR

Cable Protection Cable protection is typically required at any existing cable crossing locations and for areas where cable burial cannot be achieved. For cable protection, methods will be determined based on the location, length, and extent of the non-burial, and when all remedial burial solutions have been ruled out. Remedial burial techniques may include jet trenching or controlled flow excavation that fluidizes the surrounding sand to allow the cable to further settle into the trench. These secondary cable protection methods may include the creation of a rock berm, concrete mattress placement, rock placement, and fronded mattresses. Half shells may be used as well, and they are typically used to protect cables ends at pull-in areas and where trenching is not possible.

Scour protection may also be used, as noted in 3.3.1.9 and Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure. Reference Section 3.3.4.1.3 for potential cable protection images. Based on preliminary understanding of site conditions from geophysical and geotechnical surveys completed in 2019 and 2020, SouthCoast Wind estimates 10 percent of the Falmouth export cable route and 15 percent of the Brayton Point export cable route will require additional cable protection.

Any required crossings of other Project cables or existing third-party cables by the offshore export cables will utilize mutually agreeable crossing designs consistent with typical industry practices, which typically employ use of concrete mattresses (though other crossing methods may be assessed for use). Minimum separation distances will be determined so that both cables can be safely operated with risk of damage to either cable mitigated to the extent practicable. An example of a concrete cable protection mattress is provided in **Figure 3-31**.

Source: Subsea Protection Systems, 2021

FIGURE 3-31. EXAMPLE OF CONCRETE CABLE PROTECTION MATTRESS

Bundling and Cable Separation Depending on cable route options ultimately selected by the proposed Project and other proximate wind farm developers, there may be overlap or near-overlap between export cable corridors, especially in relatively congested areas (i.e., the Muskeget Channel, Sakonnet River, Mount Hope Bay). In the case that the proposed Project cables are close enough to other existing or planned cables that there is potential for risk to one cable (or set of cables) from another during installation and/or O&M, the proposed Project will coordinate with owners of the other cable(s) to ensure that all planned cables can be installed and operated safely.

For the Falmouth export cable corridor, target horizontal separation between each proposed Project cable is approximately 328 ft (100 m). Final cable spacing will depend on bathymetry and other detailed seabed characteristics and may be wider or narrower. Risk factors that will be considered and mitigated will include:

- Installation impacts (risk to existing cables)
- O&M (including cable repair if needed)
- Thermal impacts to adjacent cables

For the Brayton Point export cable corridor (and the Falmouth export cable corridor if HVDC transmission technology is used), the offshore export cables will be installed in a bundled configuration where practicable, though the cables may be unbundled and installed separately for part or all of the cable route. The cables will be transported separately (on the same installation vessel) and assembled into a bundle during the process of cable laying. Because the HVDC offshore export cables will be installed in a single bundle where possible, there will typically be no horizontal separation between cables within a bundle as installed along the route. If the cables are installed separately, target horizontal separation between each proposed Project cable will be approximately 164 ft (50 m). Target horizontal separation between each proposed Project cable bundle is approximately 328 ft (100 m). Final cable spacing will depend on bathymetry and other detailed seabed characteristics as described above and may be wider or narrower.

3.3.5.5 Operation and Maintenance

The offshore export cables will be buried and not expected to require regular maintenance, except for manufacturer-recommended cable testing. See Section 3.3.4.2 for more information pertaining to planned and unplanned maintenance, per manufacturer recommendations. Inspections and preventive maintenance will occur on a frequency advised by the manufacturer’s recommendations. Burial inspection visuals will occur periodically to be determined after final design and route are selected.

3.3.5.6 Decommissioning

Similar to the decommissioning of inter-array cables, offshore export cables may be retired in place or removed, as per 30 CFR § 285.909. See Section 3.3.4.2 for a description of pulling cables at J-tubes and potentially dredging cables. At landfall, if the cables are removed, the ducts will remain in place.

3.3.6 Sea-to-Shore Transition

Three potential sea-to-shore transition locations in Falmouth, Massachusetts, two potential locations at Brayton Point in Somerset, Massachusetts, and four potential locations on Aquidneck Island in Portsmouth, Rhode Island are under consideration after extensive evaluation of site feasibility and potential environmental and social impacts. The landfall locations in Falmouth, Massachusetts include Worcester Avenue, Central Park, and Shore Street, as depicted in **Figure 3-32.** The landfall locations at Brayton Point in Somerset, Massachusetts include the Western landfall location from the Lee River and the Eastern landfall location from the Taunton River, as depicted in **Figure 3-33**. Additionally, the Brayton Point offshore export cables will make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, in order to avoid a narrow and highly constrained area of the Sakonnet River at the old Stone Bridge and Sakonnet River Bridge, representing a significant challenge to survey, cable installation, burial, and operation. This landfall will require HDDs at two locations, one entering and one exiting Aquidneck Island. One landfall location is under consideration for entering Aquidneck Island, and four locations among three route options are under considering for existing Aquidneck Island as depicted in **Figure 3-3**.

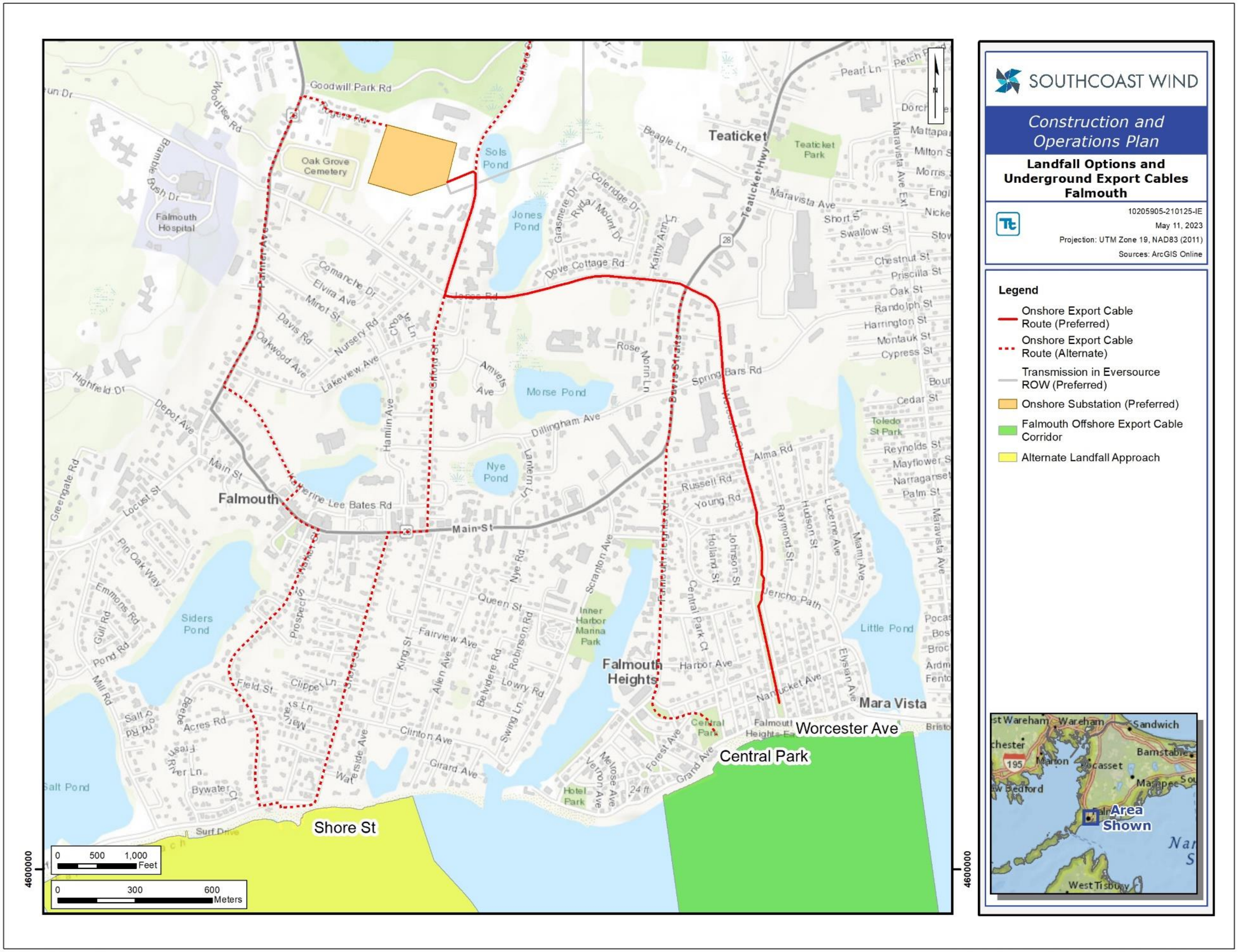


FIGURE 3-32. PROPOSED LANDFALL SITES—FALMOUTH

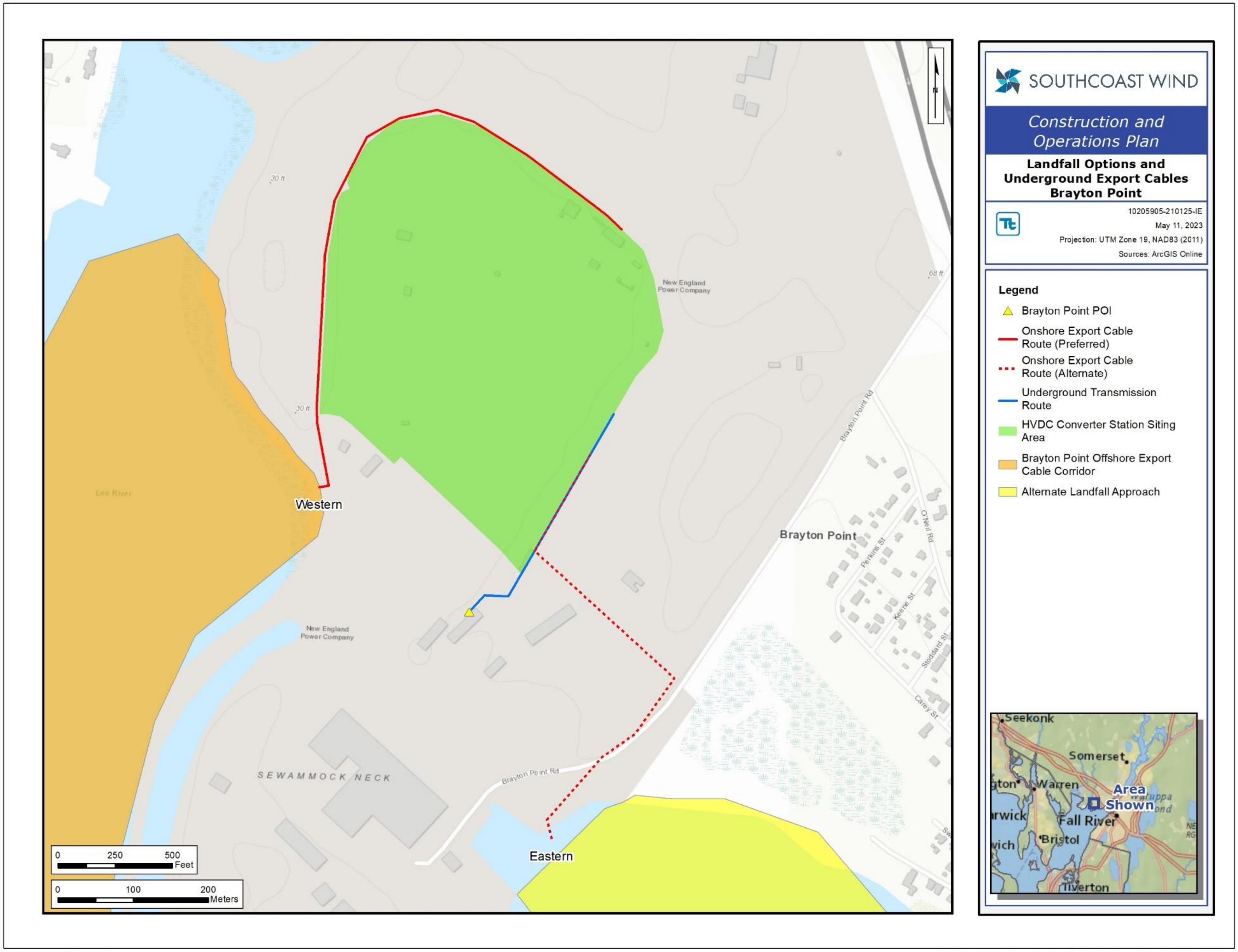


FIGURE 3-33. PROPOSED LANDFALL SITES–BRAYTON POINT

At all potential landfall locations, including those on Aquidneck Island, SouthCoast Wind will utilize HDD to transition between the ocean and the land, as depicted in **Figure 3-34**. Additional information specific to each potential landfall site is included in the subsections below.

3.3.6.1 Falmouth Landfall Option A: Worcester Avenue

The preferred landfall is the easternmost potential landfall site is located at Worcester Avenue. This location is protected by a short seawall, a broad beach, and Surf Drive. This landfall site would be located on a previously disturbed, off-road grassy median strip (also known as Worcester Park) that runs between the two lanes of Worcester Avenue. Residences and a hotel are adjacent to this landfall site but are buffered from the open green space by Worcester Avenue on either side. A paved parking lot located nearby could be used for construction staging operations.

There are no known existing submarine cables that make landfall at Worcester Avenue and this landfall would avoid the need to cross any existing submarine cables between Martha's Vineyard and Falmouth, Massachusetts.

3.3.6.2 Falmouth Landfall Option B: Central Park

The second potential landfall site is approximately 700 ft (213 m) west of the Worcester Avenue landfall location, situated at Central Park on Falmouth Heights Beach north of Grand Avenue. This landfall site would occur at a public recreational park with a baseball diamond and basketball court. The park is flanked on the southern side by paved parking spaces, which could be used for construction staging operations.

There are no known existing submarine cables that make landfall at Central Park and this landfall would avoid the need to cross any existing submarine cables between Martha's Vineyard and Falmouth, Massachusetts.

3.3.6.3 Falmouth Landfall Option C: Shore Street

The potential landfall site at Shore Street is west of the Central Park and Worcester Avenue landfall sites. It is located on Surf Drive Beach at the intersection of Surf Drive and Shore Street. An existing seawall and nearby rock jetties protect this landfall site. The Shore Street location has a large, over 2-acre (0.8-ha) public parking lot that could be used to site the cable transition joint bays and accommodate vehicles and equipment during installation operations.

The Shore Street landfall location involves the potential crossing of two existing submarine cables that also make landfall at Shore Street. The existing arrangement may allow SouthCoast Wind to HDD underneath the existing cables in the approach to the landfall location.

3.3.6.4 Brayton Point Landfall Option A: Western

The preferred (Western) landfall, the Western landfall site, for the Brayton Point landfall is located in the western portion of the former Brayton Point Power Station adjacent to where the two cooling towers were located. This landfall occurs on the previously disturbed Brayton Point property. To the south of this landfall is an open paved area which would provide an ideal space for construction staging operations.

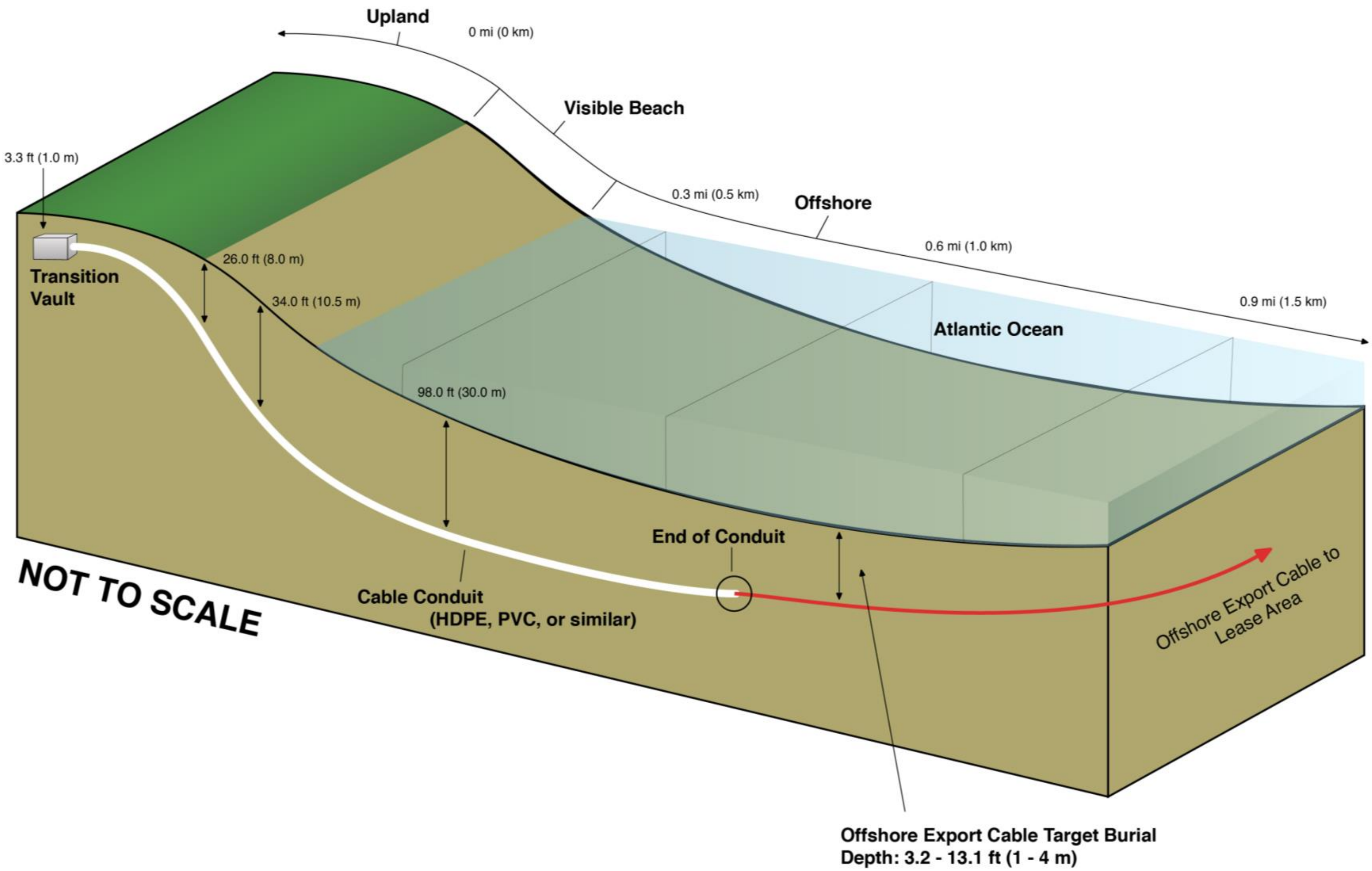


FIGURE 3-34. INDICATIVE SEA-TO-SHORE TRANSITION

3.3.6.5 Brayton Point Landfall Option B: Eastern

The alternate (Eastern) for the Brayton Point landfall, the Eastern landfall site, is located in the eastern portion of the former Brayton Point Power Station southeast of Brayton Point Road. This landfall occurs on the previously disturbed Brayton Point property at a large, paved parking lot. The parking lot will provide an ideal space for construction staging operations.

3.3.6.6 HDD Locations on Aquidneck Island (Intermediate Landfall)

The Brayton Point export cable corridor will make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island for an underground onshore export cable route section. For the entry HDD to Aquidneck Island, one location is being considered at the intersection of Boyds Lane and Park Avenue. For the exit HDD into Mount Hope Bay, four locations are under consideration: one location just northeast of the Mount Hope Bridge, one location along an existing overhead utility line corridor, one location in an existing parking lot, and one location on the northeastern side of the Montaup Country Club golf course.

3.3.6.7 Construction and Installation

Installation of the landfall facilities will include the use of onshore excavation and construction equipment, HDD equipment, and offshore cable handling vessels and equipment. HDD is a "trenchless" process for installing cables or pipes which enables the cables to remain buried below the beach and intertidal zone while limiting environmental impact during installation.

Construction related to the landfall site is expected to include the following:

- Construction of a temporary approach pit or a cofferdam at a previously disturbed site at each onshore HDD entry point
- Drilling of a pilot hole along each planned HDD trajectory, below the beach and intertidal zone, and reaming of the bore hole to the necessary diameter
- Construction of a temporary structure (e.g., cofferdam, gravity cell) at the offshore HDD exit point may be required to allow cable pull-in
- Insertion of conduit, made of High-Density Polyethylene or similar material, into each bore hole
- Installation of the offshore export cable through the conduit, below the beach and intertidal zone
- Construction of onshore buried concrete transition pits or vaults
    - For the HVAC export cables, jointing of offshore export cable (3-core submarine cable) to onshore export cable (single-core underground cable)
    - For the HVDC export cables, jointing of offshore export cable (single-core submarine cable) to onshore export cable (single-core underground cable)
- Site restoration of disturbed onshore areas

For the Falmouth landfall locations, if Falmouth is the selected POI for Project 2, the proposed HDD trajectory is anticipated to be approximately 0.9 mi (1.5 km) in length with a cable burial depth of up to approximately 90 ft (27.4 m) below the seabed. HDD bores will be separated by a distance of approximately 33 ft (10 m). Each offshore export cable is planned to require a separate HDD, with an individual bore and conduit for each export cable. If used, the dedicated communications cable may be installed within the same bore as a power cable, likely within a separate conduit.

For the Brayton Point and Aquidneck Island intermediate landfall locations, the proposed HDD trajectory is anticipated to be approximately 0.3 mi (0.5 km) in length with a cable burial depth of up to approximately 90 ft (27.4 m) below the seabed. HDD bores will be separated by a distance of approximately 33 ft (10 m). It is anticipated the HVDC cables will be unbundled at landfall. Each HVDC power cable is planned to require a separate HDD, with an individual bore and conduit for each power cable. Each dedicated communications cable may be installed within the same bore as a power cable, likely within a separate conduit.

HDD can be undertaken from either the onshore entry point, from the offshore exit point, or from a combination of the two. If the HDD will be undertaken from the onshore entry point, the HDD rig will be positioned in a previously disturbed area within the landfall site.

3.3.6.8 Operation and Maintenance

The landfall facilities will be buried and not expected to require regular maintenance. The onshore transition joint/vault can be accessed for planned inspections or maintenance, and for unplanned maintenance on an as-needed basis. Periodic visual inspections of the joints may be planned based on contractor and manufacturer recommendations.

3.3.6.9 Decommissioning

The decommissioning of the transition vault will be coordinated closely with the host town to ensure that decommissioning activities meet the town’s energy infrastructure needs and have the fewest environmental impacts. Subject to those future discussions, it is envisioned that the transition vault will be retired in place for possible future reuse. The decommissioning approach selected for offshore export cables is in Section 3.3.4.3.

3.3.7 Onshore Underground Export Cable

From the landfall site options, the underground onshore export cables will be routed to the new onshore substation or converter stations, depending on the landfall location (described in Section 3.3.6). One of three Falmouth onshore export cable routes and one of two Brayton Point onshore export cable routes from the landfall site options will be utilized based on landfall site selection, as presented in **Figure 3-32** and **Figure 3-33**.

Table 3-18 presents the onshore export cable parameters under consideration and **Table 3-19** details all potential maximum lengths from the Falmouth landfall sites to both onshore substation options under consideration. **Table 3-20** details all potential lengths from the two Brayton Point landfall sites to the converter stations under consideration. **Figure 3-32** and **Figure 3-33** shows all potential underground, onshore export cable route options.

Under the Falmouth Variant option, the underground Falmouth onshore export cables will consist of up to four circuits with three, single-core cables per circuit, for a total of 12 onshore export power cables. Additionally, there may be up to four smaller insulated single-core ground continuity cables for carrying fault currents, and up to five communications cables containing fiber optics (one per circuit plus one dedicated communications cable).

The underground Brayton Point onshore export cables will consist of up to four onshore export power cables. Additionally, there will be up to two communications cables containing fiber optics.

Additionally, an intermediate landfall will occur on Aquidneck Island in Portsmouth, Rhode Island, including a 3 mi (4.8 km) underground onshore export cable route, as part of the Brayton Point export cable route. This underground onshore cable route will consist of up to four onshore export cables and up to two communications cables.

TABLE 3-18. ONSHORE EXPORT CABLE PARAMETERS

Onshore Export Cable Parameter	Falmouth Minimum	Falmouth Maximum	Brayton Point Minimum	Brayton Point Maximum
Number of Export Power Cables	3	12	1	4
Number of Communication Cables	1	5	1	2
Number of Insulated Single-Core Ground Continuity Cables	1	4	N/A	N/A
Length of Onshore Export Cable	1.9 mi (3.0 km)	6.4 mi (10.3 km)	—	3,940 ft (1,200 m)
Approximate Cable Diameter	—	5.59 in (142 mm)	—	5.9 in (150 mm)
Nominal Cable Voltage	200 kV (±525 kV if HVDC)	345 kV a/ (±525 kV if HVDC)	±320 kV	±320 kV
Approximate Cable Load Current	—	1,200 A	—	2,000 A

Note:
a/ The maximum rated cable voltage is up to 362 kV.

TABLE 3-19. MAXIMUM DISTANCES FROM FALMOUTH LANDFALL OPTIONS TO ONSHORE SUBSTATION OPTIONS

Onshore Substation	Landfall Site	Distance from Landfall to Substation
Lawrence Lynch	Worcester Ave	2.0 mi (3.3 km)
	Shore St	2.3 mi (3.6 km)
	Central Park	2.2 mi (3.5 km)
Cape Cod Aggregates	Worcester Ave	5.9 mi (9.4 km)
	Shore St	6.4 mi (10.25 km)
	Central Park	6.1 mi (9.8 km)

TABLE 3-20. DISTANCES FROM BRAYTON POINT LANDFALL OPTIONS TO CONVERTER STATION

Onshore Substation	Landfall Site	Distance from Landfall to Converter Station
Converter Station	Western	Up to 0.6 mi (1.0 km)
	Eastern	Up to 0.7 mi (0.6 km)

3.3.7.1 Construction and Installation

Similar to offshore cables, onshore cables can be manufactured and transported to site from various factory locations depending on availability, proximity to site, and available transportation. The onshore export cables will be installed within existing roadways, where feasible. A pre-engineering survey will be performed to identify underground utility obstructions or potential crossings including other high-voltage cables or pipelines.

All circuits will be installed in cable trenches located in the existing roadways that the onshore export cable route options travel along. The cable trench is likely to consist of a single large trench where the cables will be pulled through ducts in a duct bank. Alternatively, the cables may be installed by directly burying them in the road and backfilled without the concrete encasement where suitable. Multiple smaller trenches may be necessary depending on available space along the cable route.

Duct bank construction is expected to progress at 20–200 ft (6.1–61.0 m) per day. The maximum anticipated width of the trench excavation is anticipated to be approximately 11.0 ft (3.3 m) per trench. In areas where trench boxes cannot be used, the maximum width of disturbance will be 35.0 ft (10.7 m) per trench. The typical excavation depth will be approximately 8.0 ft (2.4 m) deep but could be deeper depending on survey results and potential utility crossings. Splice vaults or direct buried splice pits will be placed at required location along the route, per the final design. After completion of trenches, duct banks, and vaults or pits, cable installation and pulling operations will be performed.

The equipment used will be typical for any high-voltage open-cut trench installation and may include equipment such as excavators, front-end loaders, dump trucks, concrete trucks, skid steers, flat bed trailers, shoring systems, padding machines, compaction equipment and trench boxes. Typical equipment used for cable installation includes a winch, cable reel cart, box trucks, splicing and terminating tools, and other miscellaneous tools. Cable pulling technicians will maintain cable pulling speed and monitor the tension of the pull.

3.3.7.2 Operation and Maintenance

The onshore export cables will be buried and are not expected to require regular maintenance, except for manufacturer-recommended cable testing as an asset condition assessment strategy. Onshore splice pits or vaults may be subject to periodic visual inspection based on manufacturers recommendations. Planned outages are not expected for the periodic inspections.

3.3.7.3 Decommissioning

Decommissioning of onshore facilities will be coordinated closely with the MA EFSB and RI EFSB to ensure that decommissioning activities meet state needs and have the fewest environmental impacts. Subject to those future discussions, it is envisioned that the onshore cables, the duct bank itself, and vaults will be left in place for possible future reuse.

If the onshore export cable removal is determined to be required, cables will be pulled out of the transition vault and duct banks and sent to repurposing or recycling facilities. The duct bank itself would remain in situ. Removal of cables from the duct bank will be done using one of the following methods: truck mounted winches, cable reels, cable reel transport truck, or simply chopped to trailer length as they are pulled out and loaded straight onto a truck.

Reusing and/or recycling the Project components for scrap metal or other materials will be the preferred method of decommissioning. Generally, decommissioning activities will have similar environmental impacts to construction and installation.

3.3.8 Onshore Substation and HVDC Converter Station

SouthCoast Wind may commission the development of one new onshore substation to transform the underground export cable transmission circuit of 345-kV transmission for interconnection with the Falmouth POI, if Falmouth is selected as the POI for Project 2. There are two onshore substation locations under consideration, including the Lawrence Lynch site at 396 Gifford Street (Option A) and the Cape Cod Aggregates site at 469 Thomas Landers Road (Option B). Section 12, Zoning and Land Use, describes surrounding land use for both sites.

SouthCoast Wind will commission the development of up to two new HVDC converter stations to convert the Project’s HVDC power to 345-kV HVAC for interconnection with the Brayton Point POI. The converter stations will be constructed at the site of the former Brayton Point Power Station. Section 12, Zoning and Land Use, describes the surrounding land use.

3.3.8.1 Onshore Substation Option A: Lawrence Lynch

The preferred onshore substation, Option A at the Lawrence Lynch site, is west of Gifford Street and north of Jones Road at the end of Stephens Lane in Falmouth, Massachusetts. This site is approximately 27.3 acres (11.05 ha). The onshore export cables from the landfall site will enter the onshore substation in the southeast corner of the yard, and the 345-kV transmission line will exit the yard in the southeast corner near the existing transmission ROW. **Figure 3-35** depicts an indicative onshore substation footprint at this location.

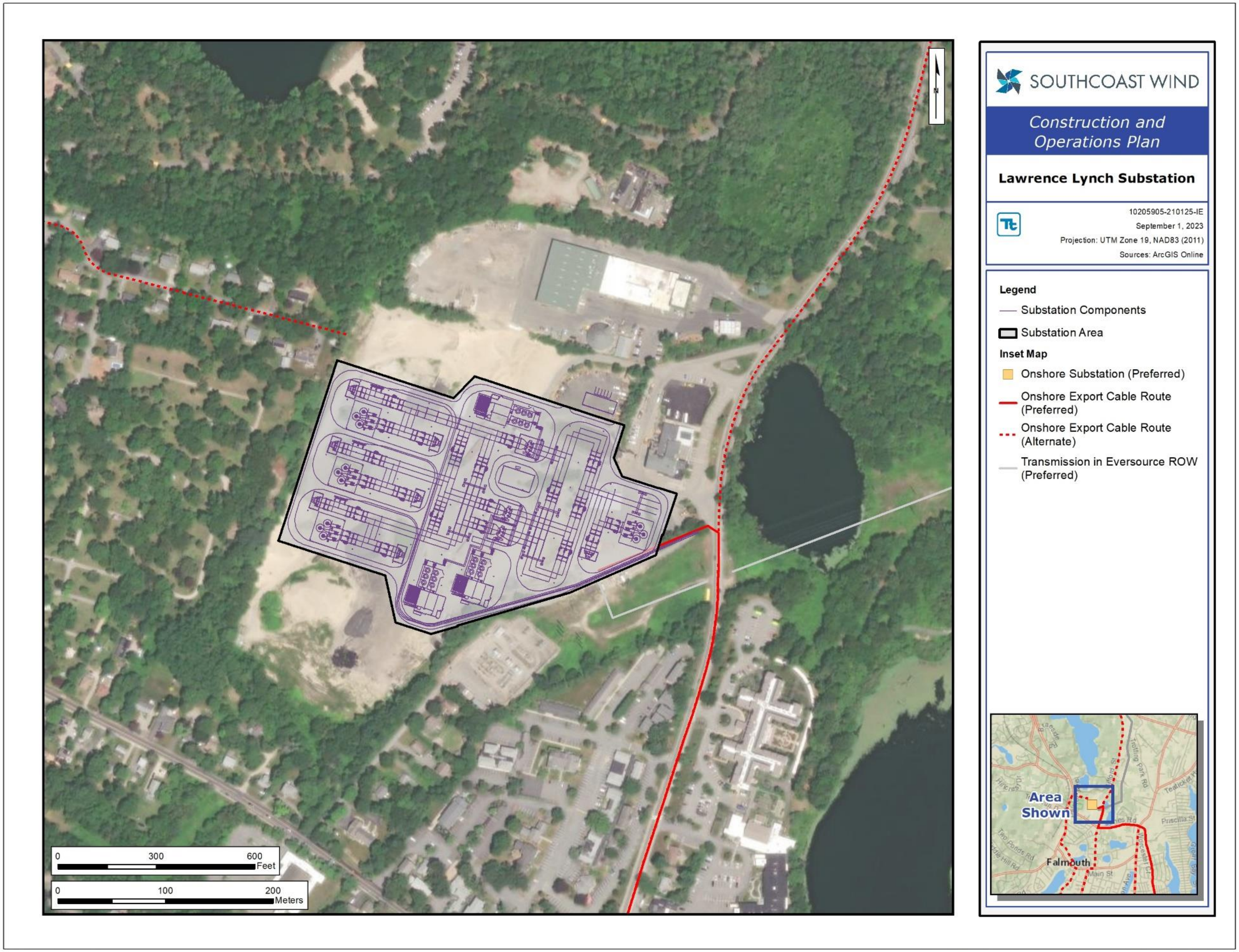
An air-insulated substation (AIS), gas-insulated substation (GIS), or a mixture of both may be used for the proposed Project. Major components proposed for inclusion within the SouthCoast Wind-owned onshore substation include, but are not limited to, either air-insulated or gas-insulated circuit breakers, disconnect and earthing switches (i.e., switchgear), fixed and/or variable shunt reactors, instrumentation, overvoltage protection and 275/345 kV transformers. A substation building will contain communication and control panels, auxiliary power equipment, and potentially, switchgear (for the gas-insulated switchgear option). Potential additional equipment includes harmonic filters, synchronous condensers, and static synchronous compensators. The maximum footprint of the onshore substation site may be up to 26 ac (10.52 ha).

3.3.8.2 Onshore Substation Option B: Cape Cod Aggregates

Option B at the Cape Cod Aggregate site is at the north end of Blacksmith Shop Road and borders the north side of Thomas B Landers Road in Falmouth, Massachusetts. This site has approximately 33.6 ac (13.6 ha) of usable land for constructing an onshore substation. Option B has sufficient space for both AIS and GIS configurations. The onshore export cables will enter the onshore substation from the southeast corner of the parcel, and the 345-kV transmission line will exit the parcel in the west. **Figure 3-36** depicts an indicative onshore substation footprint at this location.

3.3.8.3 HVDC Converter Station

The converter stations will be located on the northern portion of the former Brayton Point Power Station site. The coal fired plant was decommissioned in 2017. The maximum footprint of each converter station site will be up to 7.5 ac (3 ha). The onshore export cables will enter the converter station site from the west or from the southeast corner, depending on which onshore export cable route is chosen. From each converter station, the 345-kV underground transmission line will exit the converter station site from the north or from the southeast corner. **Figure 3-37** depicts an indicative onshore substation footprint at this location.



NOT FOR CONSTRUCTION

Path: \\Cess706gisfs1\CES\Projects\BOS\GIS\Mayflower\GIS\Spatial\MXD\COP\ProjectDescription\COP_PD_LawrenceLynch.mxd

FIGURE 3-35. INDICATIVE ONSHORE SUBSTATION OPTION A LAYOUT

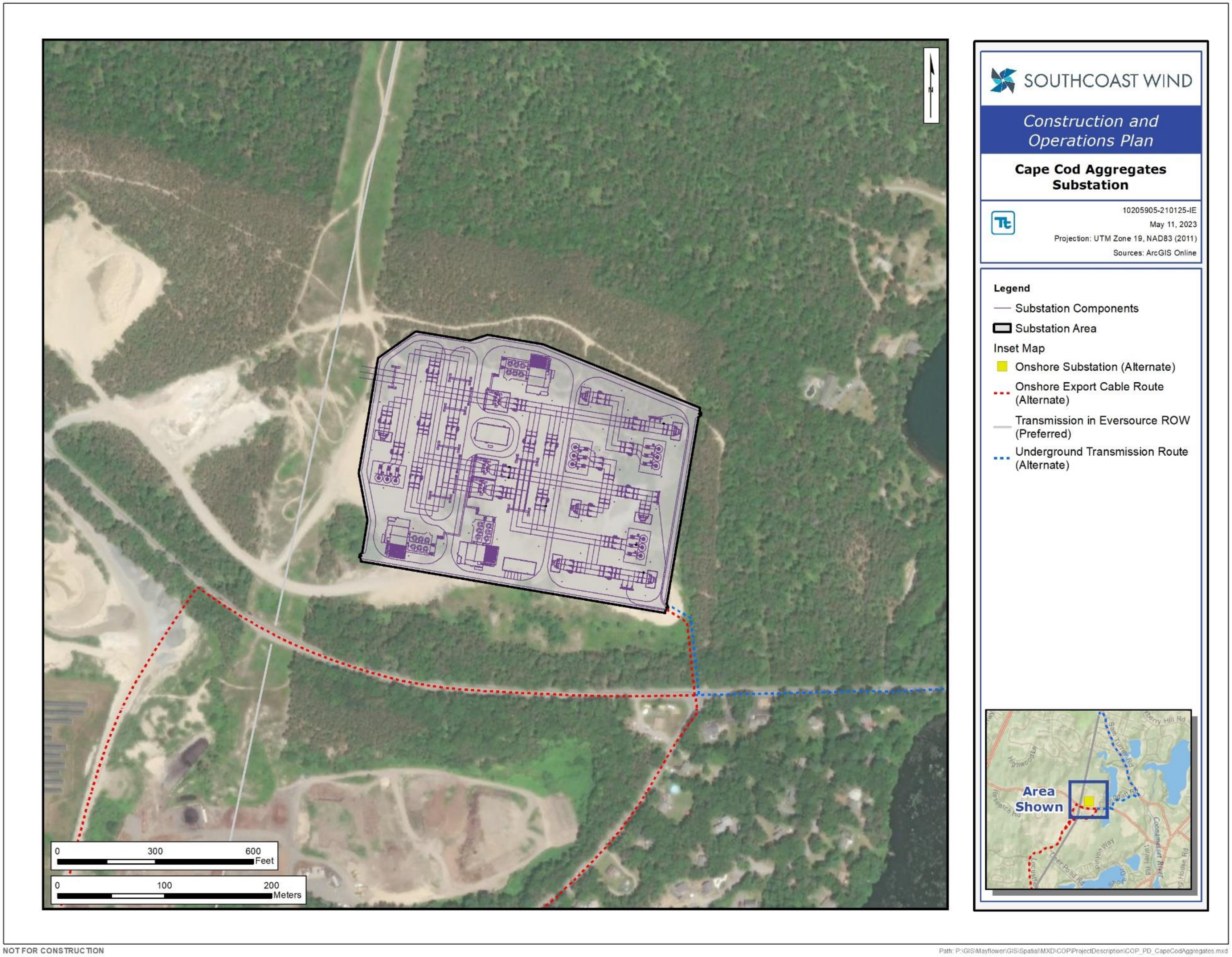


FIGURE 3-36. INDICATIVE ONSHORE SUBSTATION OPTION B LAYOUT

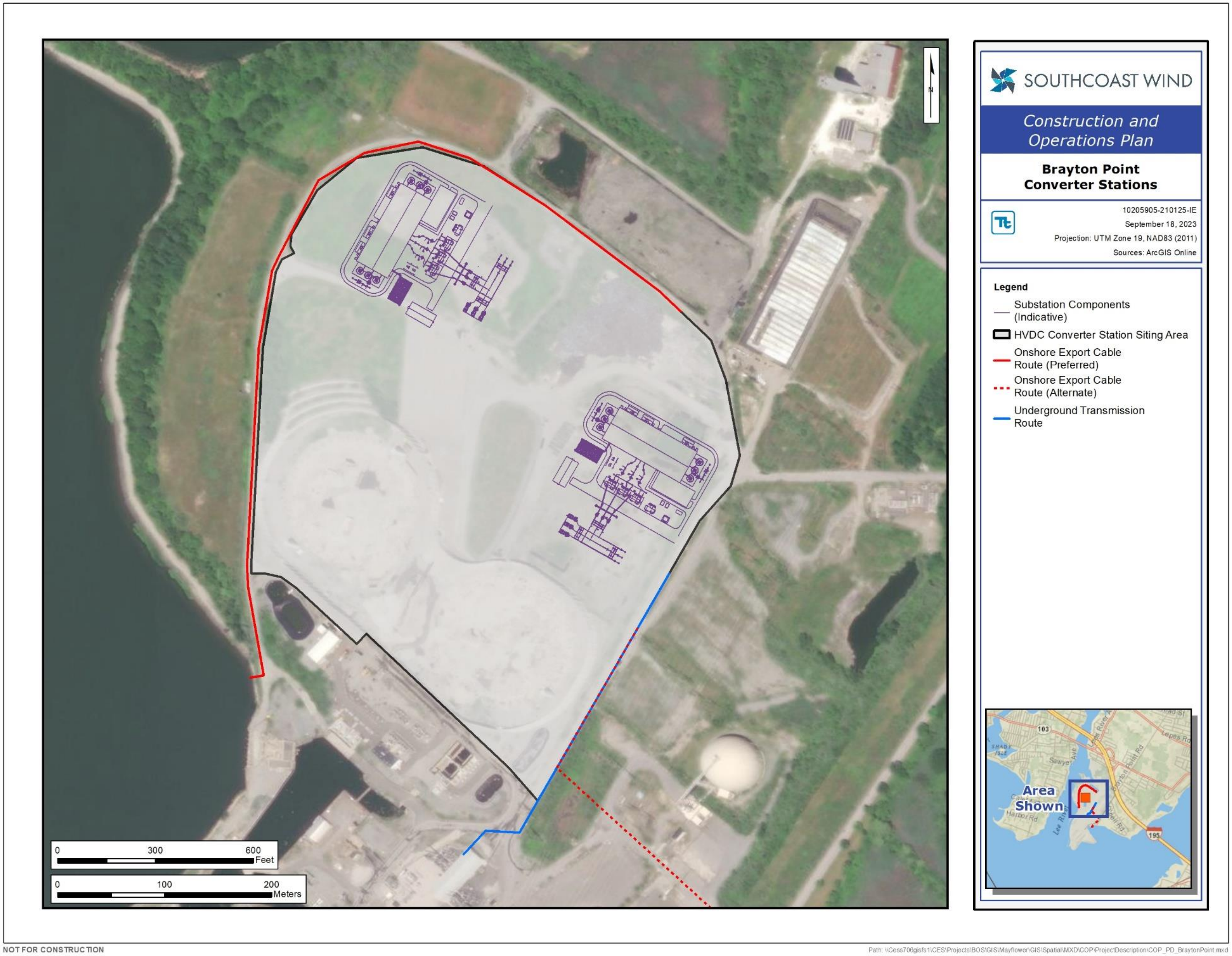


FIGURE 3-37. INDICATIVE ONSHORE CONVERTER STATION LAYOUT

3.3.8.4 Construction and Installation

To prepare the construction area, the site will be graded, cleared, and fitted with temporary erosion and sediment control barriers (where needed) as a preventive measure to protect the surrounding environment. These erosion and sediment control barriers may include silt fencing, filter socks straw wattle, and hay bales. Construction of the civil and electrical components of the onshore substation and converter stations will require over-the-road delivery trucks for larger components and construction machinery (such as platform trailer), delivery trucks for other materials, cranes to install transformers, cranes that perform on uneven ground, mobile lifts, and support vehicles. A rail or barge may also be used to transport transformers, reactors, and other heavy equipment.

Onshore substation and converter station construction can be split into two phases: the civil construction and the electrical construction.

Civil Construction The civil phase of substation/converter station construction entails site clearing, soil cutting and filling activities, installation of storm water management infrastructure, installation of below grade electrical conduits and grounding grid, and foundation installation. Equipment used during the civil portion of onshore substation/converter station construction will include excavators, backhoes, bulldozers, dump trucks, concrete trucks, forklifts, compaction equipment and other miscellaneous construction equipment.

Once the site has been graded to the proper elevation, foundation installation can begin. A variety of foundations may be used depending on the site soil and geotechnical conditions. These foundation types include slabs, spread footers, drilled piers, and pile caps. While each foundation type requires its own construction protocols and method, each will generally include excavation, installation of steel reinforcement, and placement of concrete. Following the foundations or in parallel, the below grade electrical services are installed. This includes below grade electrical conduits and the below grade grounding system. Support services may also be provided, if needed, at the site. For example, there is possibility of constructing restrooms with septic and sewerage. Temporary erosion and sedimentation control barriers are installed before the disruption of any soil. After the control barriers are installed, the storm water management systems which involve the use of infiltration basins and piping will be installed.

Electrical Construction The electrical phase of substation/converter station construction requires the installation of major substation/converter station equipment, buildings, steel, lighting protection systems, lighting, and other facility systems. Major equipment used for the electrical onshore substation/converter station construction phase will include cranes, forklifts, cable pulling equipment, man lifts, jacking equipment, and other miscellaneous construction equipment. Electrical construction will start once the majority of civil construction activities have been completed. Large equipment including transformers and circuit breakers will be installed using cranes or alternatively be jacked and slid onto foundation pads. Appropriate installation methods will be selected based on the exact size, weight, and site-specific constraints. Man lifts and ladders will be utilized as needed to complete final assembly of the equipment.

At this point, a pre-commissioning field test will be conducted, while a commissioning field test will be conducted after the full system is complete, see Section 3.3.11 for more commissioning details.

Substation buildings house electrical and control equipment and will be constructed as required. Below is a list of the normal process conducted at onshore substation/converter station sites during testing.

- Equipment (Factory Acceptance Test) in factory
- Commissioning (Site Acceptance Test) on site
  - Cold commissioning
- Mechanical completion
- Pre-commissioning
- Integration test
  - Hot commissioning
- Pre-energization
- Post-energization
- Trial operation

Substation/converter station buildings are anticipated to be pre-engineered metal panel buildings or precast concrete buildings depending on the final design requirements. Steel, lightning masts and shield wires, and site lighting will also be installed during the electrical construction phase.

3.3.8.5 Operation and Maintenance

SouthCoast Wind's onshore substation/converter stations will be designed to serve as an unmanned station. During typical operation, there will be no need for an operator to be present on site. SouthCoast Wind O&M personnel, contracted or otherwise, will visit the onshore facilities periodically for equipment inspections and to perform planned and potentially unplanned maintenance activities, including performing necessary inspections. Most maintenance activities will be minor in nature and will not require heavy construction equipment. There is a rare possibility that significant maintenance activities may need to occur that will require heavy construction equipment on site. Visual maintenance and on-site inspections for major equipment will follow original equipment manufacturer (OEM) recommendations.

3.3.8.6 Decommissioning

Decommissioning of the onshore facilities will be coordinated closely with the host towns of Falmouth and Somerset, Massachusetts, and aim to have the fewest environmental impacts. Subject to those future discussions, it is envisioned that the elements of the onshore substation/converter stations will be left in place for possible future reuse.

Reusing or repurposing the onshore facilities for town use is the preferred method of decommissioning. Recycling of scrap metal or other materials is a viable alternative. If disassembly will need to occur, the onshore substation/converter station decommissioning activities will have similar environmental impacts to construction and installation.

3.3.9 Underground Transmission Route

3.3.9.1 Description and Configuration

At Brayton Point, SouthCoast Wind intends to use an underground transmission route to connect each converter station to the POI; the route is shown on **Figure 3-5**. As an alternate, SouthCoast Wind may be required to utilize an overhead line for the short AC transmission route at Brayton Point if significant underground infrastructure remains from the decommissioned cooling towers and prevents a suitable buried path.

If Falmouth is the selected POI for Project 2, the overhead transmission lines will be permitted, constructed, and operated by Eversource. The preferred transmission scenario for Falmouth is aboveground lines, however an alternate underground transmission route is also under consideration as shown on **Figure 3-4**.

The description and configuration of the underground transmission lines will be similar to that described for the onshore export cables in Section 3.3.7.

3.3.9.2 Construction and Installation

The same construction and installation methods described in Section 3.3.7.1 will be utilized for the underground transmission routes.

3.3.9.3 Operation and Maintenance

The alternate underground transmission routes O&M will be very similar to the onshore export cable O&M in that it will be buried, and regular maintenance is not expected, except for manufacturer-recommended cable testing. Onshore splice pits or vaults may be subject to periodic visual inspection. Planned outages are not expected for the periodic inspections. See Section 3.3.7.2 for O&M tasks and indicative schedule that may be applied to the underground transmission routes.

3.3.9.4 Decommissioning

The underground transmission routes will have similar decommissioning activities as those described for the onshore export cable, in Section 3.3.8.6.

3.3.10 Points of Interconnection

Both export cable routes will connect at existing POIs. If Falmouth is the selected POI for Project 2, the Falmouth POI will be located at or near the existing Falmouth Tap POI, located off Sam Turner Road in Falmouth, Massachusetts. Eversource will be responsible for designing, permitting, constructing, and operating the Falmouth Tap POI within the Eversource ROW. Accordingly, impacts related to the construction of the POI are not included herein.

The Brayton Point POI will be located adjacent to an existing National Grid substation on the site of the former Brayton Point Power Station. The POI is a 345-kV GIS facility and has an available breaker bay previously use for the power plant. Accessing the breaker will be via standard steel work outside National Grid’s building to land the underground transmission cable or overhead line as well as connection of communication/fiber cables and associated gear.

3.3.10.1 Operation and Maintenance

SouthCoast Wind O&M personnel, contracted or otherwise, will visit the onshore substation/converter station sites periodically for equipment inspections and to perform planned and potentially unplanned maintenance activities, including performing necessary inspections. Most maintenance activities will be minor in nature and will not require heavy construction equipment. There is a rare possibility that significant maintenance activities may need to occur that will require heavy construction equipment on site. Visual maintenance and on-site inspections for major equipment will follow OEM recommendations.

3.3.10.2 Decommissioning

The Falmouth POI and the Brayton Point POI are owned by the local utilities and will remain in place and integrated into the regional transmission system. Given this, no decommissioning activities are planned.

3.3.11 Commissioning Activities

Commissioning will take place in a systematic fashion with the general process moving from onshore to offshore. SouthCoast Wind will develop an overall commissioning strategy based on OEM requirements, and requirements of the grid and transmission system operator, the exact commissioning sequence which will be based on the final design of the Project. Commissioning of the Project will be managed through a central control point.

Commissioning will take place in two phases: “Cold,” prior to energization, and “Hot,” post energization.

Cold commissioning will consist of a combination of visual inspections and tests performed on project components and systems to verify system integrity and the operation of control and safety systems. System and equipment testing will include: verification of completion of mechanical, electrical and safety systems, functional mechanical checks, protection system tests, electrical insulation testing, pre-energization checks, trip tests, and load checks. The primary Cold commissioning steps are the same for onshore and offshore components.

Hot commissioning for onshore and offshore components will occur following energization of the proposed Project’s electrical system. SouthCoast Wind plans to conduct Hot commissioning activities utilizing power supplied from the grid, which will occur after the grid interconnection in-service date, this will allow for delivery of power generated by the Project. If the grid connection is delayed, SouthCoast Wind may conduct Hot commissioning of some offshore components using temporary diesel generators.

Energization of Project components will be closely coordinated with the transmission system operator. Each part of the system is energized and commissioned through a series of site acceptance tests, starting with systems closest to the POIs, such as interconnection circuits and the onshore substation/converter stations, followed by the export cable system, the OSPs, etc. After the grid interconnection is energized, commissioning steps include checking and testing of major substation/converter station components, electrical circuits, sensors, auxiliary and safety systems. Additional commissioning steps for the substation/converter stations include checking and testing of major facility components, electrical circuits, sensors, auxiliary and safety systems.

During commissioning, a variety of electrical and mechanical work and quality testing will occur. Commissioning requires technicians to frequently travel to each WTG and OSPs. Technicians will likely be transported to and from the Project Area by Crew Transfer Vessels (CTVs), Service Operations Vessel (SOV), and helicopters. A typical commissioning process includes the following steps:

- Onshore at the port: WTG tower electrical and mechanical tests, checks, and quality controls to validate functionality of components installed in the tower and in the nacelle, and of the interface between components in tower and nacelle

- Offshore Cold commissioning: Electrical and mechanical tests, checks, and quality controls to validate mechanical and electrical integrity of the complete WTG prior to energizing
- Offshore Hot commissioning: Final electrical tests, checks, and quality controls to validate systems interactions, while the WTG is energized but not generating
- Reliability testing: Operational testing of each WTG in normal conditions, including electrical and mechanical tests, checks, and quality controls to validate reliability and systems interaction

A detailed commissioning procedure will be developed with manufacturers recommendations along with the transmission system operator and ISO-NE. This will be updated for review in the FDR and Fabrication and Installation Report submittals.

3.3.12 Marking and Lighting

The proposed Project will abide by all relevant Federal Aviation Administration (FAA), International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) (IALA, 2013), and USCG regulations regarding the visibility of the proposed Project's components within the Lease Area as set forth by BOEM's *Guidelines for Lighting and Marking of Structures Supporting Renewable Energy Development* (BOEM, 2021).

SouthCoast Wind will align with the latest Offshore Structure Private Aids to Navigation Marking Guidance from the U.S. Coast Guard (USCG, 2020). It is anticipated that this guidance will include lighting to be placed on all structures and will be visible throughout a 360-degree arc from the surface of the water. Quick flashing yellow lighting energized at a 5 nm (9.26 km) range will be included for corner towers and significant peripheral structures. Outer boundary towers will include 2.5 second flashing yellow lights energized at a 3 nm (5.6 km) range. Interior towers will include 6 or 10 second flashing yellow lights energized at 2 nm (3.7 km) range. All lighting will be synchronized by structure location and all temporary construction components will be marked with quick yellow obstruction lights visible through 360-degrees at a 5 nm (9.26 km) distance.

Tower marking and identification will include unique and organized rows and columns of letters and numbers to maximize charting effectiveness. The letters and numbers will be labeled to as close to 9.8 ft (3.0 m) high as possible. All marking will be visible above and below any servicing platforms and visible throughout a 360-degree arc from the surface of the water. Reflective paint and lettering/numbering materials will be used as to provide visibility at night.

SouthCoast Wind will implement an Aircraft Detection Lighting System (ADLS), which will activate the lighting system on the WTGs based on approaching air traffic. Based on the Capitol Airspace Group ADLS Efficacy Analysis (Appendix Y3), an ADLS-controlled obstruction lighting system could result in over a 99 percent reduction in system activated duration as compared to a traditional always-on obstruction lighting system. More information pertaining to the ADLS Efficacy Analysis can be found in Appendix Y3. Use of ADLS by the Project will be subject to technical feasibility, commercial availability, and agency review and approval, including approval from U.S. Department of Defense (DoD).

3.3.13 Port Facilities

3.3.13.1 Marshalling Port

A marshalling port is a location where Project components may be delivered from the manufacturer, may be partially assembled or pre-commissioned, and subsequently transferred to the installation site. Marshalling ports must have ample laydown and storage acreage and direct access to the ocean or navigable channels. SouthCoast Wind will likely use more than one marshalling port for the proposed Project. Ports under consideration are depicted in **Figure 3-38**. SouthCoast Wind is also considering ports outside of the U.S.

The installation strategy selected for each component will narrow marshalling port options. For example, SouthCoast Wind could have individual Project components fabricated and delivered directly from foreign fabrication sites to the Project Area; therefore, storage acreage would not be a deciding factor for port selection.

3.3.13.2 Operation and Maintenance Facility

SouthCoast Wind's preference is to use a Massachusetts-based port for O&M operations which could be a long-term lease of one of the marshalling ports listed in Section 3.3.13.1 (see **Figure 3-39**). The O&M facility will have trained staff, office space, and a warehouse for spare parts. The preliminary plan for the O&M strategy is to use one SOV and two CTVs. The SOV would be a larger vessel with the ability to stay in the Lease Area and house crews overnight. CTVs would be used to transfer crew and small parts to and from, and also within the Lease Area. Additional vessels, helicopters, and drones could be used for urgent personnel transfer, part delivery, cable, or substructure and WTG inspections or other planned or unplanned maintenance. A repair of a major piece of equipment such as a transformer on an OSP would require a jack-up barge or floating crane and additional planning in addition to the SOV and CTVs used for routine maintenance. Vessels listed in **Table 3-21** may also be used during the operational phase as required. These vessels may directly transit to the Project Area, depending on the location of origin, maintenance need, and vessel availability.

3.3.14 Vessels, Vehicles, and Aircrafts

3.3.14.1 Construction and Installation

As discussed throughout the sections above, SouthCoast Wind will utilize a number of different vessels for the transportation, installation, and operation of Project components. **Table 3-21** and **Table 3-22** provides a list of the major vessels, aircraft and vehicles required for the construction and installation of the proposed Project.

While the proposed Project's vessel deployment plan will be finalized in coordination with selected contractors. Under the base case assumption, SouthCoast Wind expects a daily average of 15–35 vessels depending on construction activities, with an expected maximum peak of 50 vessels in the Lease Area at one time.

A number of support vessels will be utilized during all Project phases for support tasks mentioned in **Table 3-21** and **Table 3-22**. For example, SouthCoast Wind plans to utilize CTVs during multiple construction activities (such as supporting WTG installation) and O&M activities (such as transferring technicians to site).

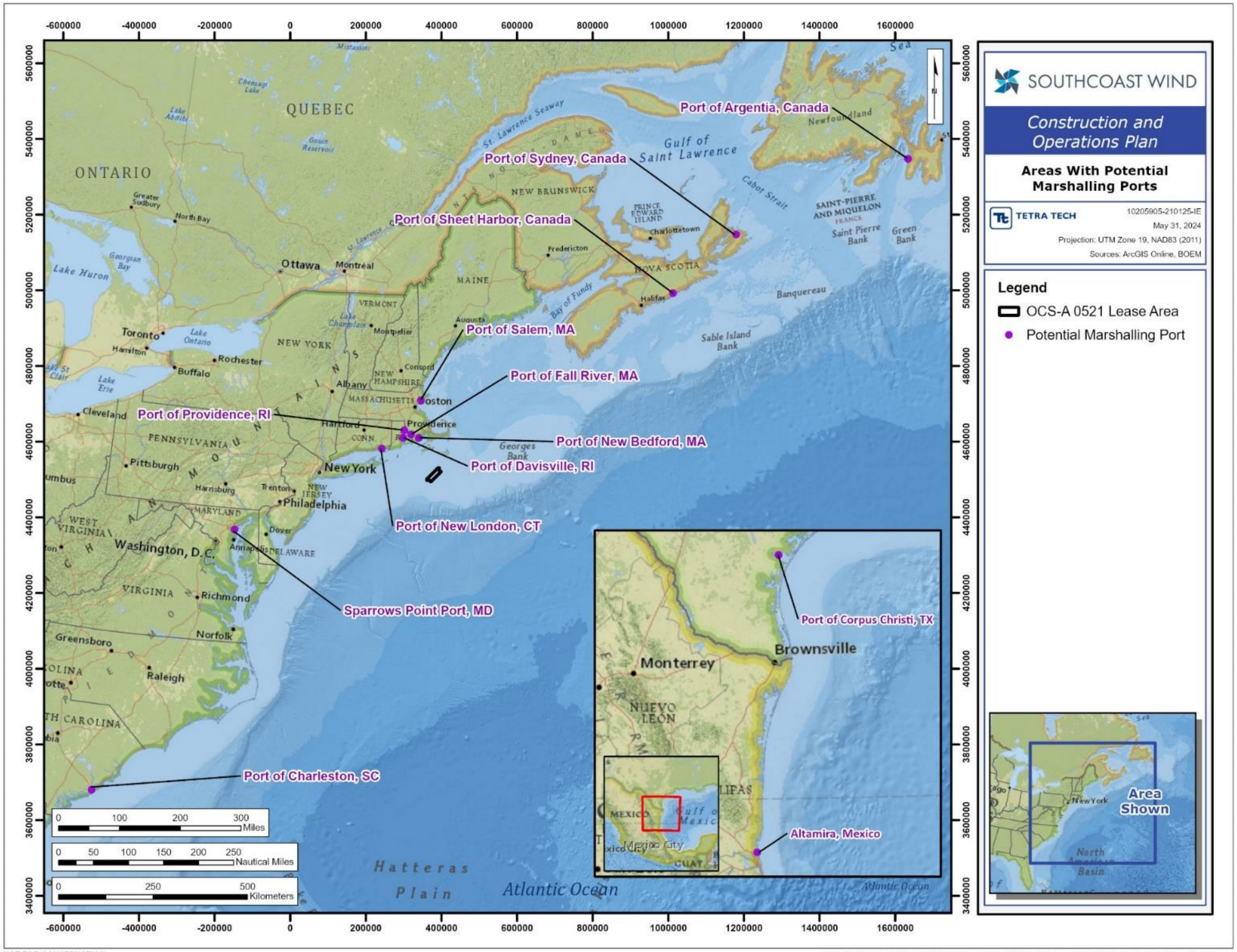


FIGURE 3-38. POTENTIAL MARSHALLING PORT LOCATIONS

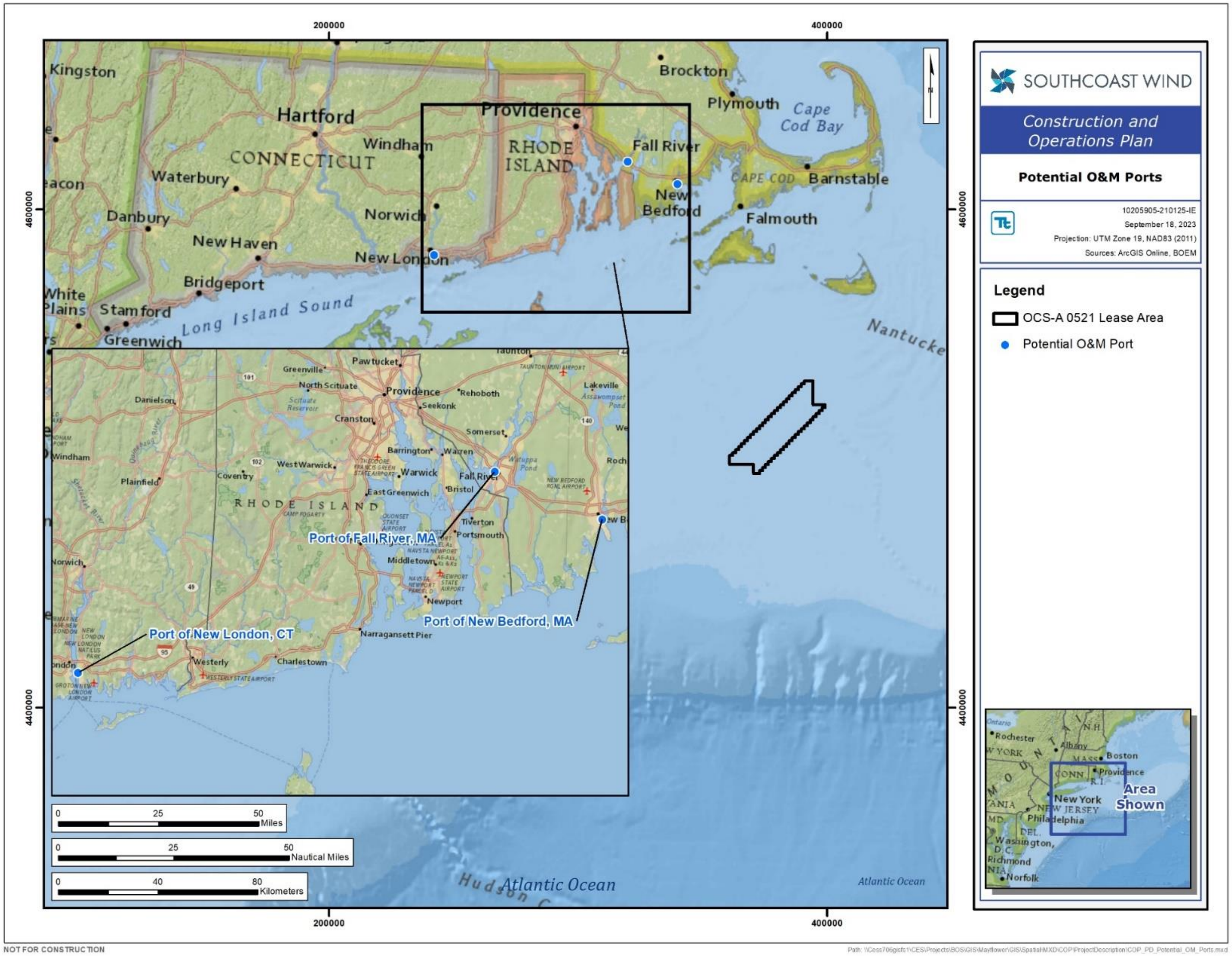


FIGURE 3-39. POTENTIAL O&M PORTS

TABLE 3-21. INDICATIVE OFFSHORE PROJECT VESSELS AND VEHICLES AND DATA

Vessel/Vehicle	Activity	Estimated Number of Vessels	Estimated Vessel Length (m)	Operational Speed / Maximum Speed	Annual (A) / Monthly (M) Round Trips a/
Airplane	Mammal watch, general support	1-2	15	100 - 120 knots (kn)	140 (A)
Anchor Handling tug	Anchor handling, general support	1-10	60	10 kn / 15 kn	15 (A)
Cable Lay Barge	Transportation and installation of cable and/or dredging (shallow water sections)	1-3	80	<5kn / 15 kn	240 (A)
Cable Transport and Lay Vessel	Transportation and installation of export cable and IAC and/or cable burial activities	1-5	130	2 kn / 11.5 kn	10 (A)
Crew Transfer Vessel (CTV)	Commissioning, crew transport, general operations, environmental monitoring and marine mammal observers.	2-5	25 - 40	10 kn / 35 kn	140 (A)
Dredging vessel	Seabed preparation, inspection, mattress installation, general support	1-5	175	2 kn /15 kn	30 (A)
Drones (Fixed wing, single and/or multi-rotor)	Onsite inspection, marine mammal monitoring and identification,	1-5	1.25	0 – 100 mph	N/A (A)
Heavy Lift Crane Vessel	Transport, transfer and installation of Substructures, WTG, OSP(s) and related components	1-5	225	0 kn / 15 kn	10 (A)
Heavy Transport Vessel	Transportation of substructures, WTG, OSP(s) and other project components	1-20	300	12 kn /15 kn	5 (A)
Helicopter	Crew changes, part transport, general support	1-4	16	100 –145 kn	520 (A) b/

Vessel/Vehicle	Activity	Estimated Number of Vessels	Estimated Vessel Length (m)	Operational Speed / Maximum Speed	Annual (A) / Monthly (M) Round Trips a/
Jack-up Accommodation Vessel	Commissioning activities	1-2	70	0 kn / 15 kn	15 (A)
DP Accommodation Vessel	Commissioning activities	1-2	100	0 kn / 15 kn	5 (A)
Multipurpose Support Vessel	Seabed preparation, inspection, mattress installation, diving, general support, environmental monitoring and marine mammal observers, noise mitigation, pre- and post- installation inspection surveys	1-8	100	10 kn / 15 kn	1020 (A)
Scour protection installation vessels	Scour protection installation	1-2	175	2 kn / 15 kn	520 (A)
Service Operations Vessel	Commissioning using SOV, general operations.	1-4	60-100	10 kn / 25 kn	70 (A)
Survey Vessel	Specialized survey work, if required	1-5	60	2 kn/ 12 kn	5 (A)
Tugboat	Transportation to site from staging port, port operations	1-12	50	5 kn / 16 kn	510 (A)
Barge	Transportation of components to Site from staging port	1-6	122	N/A	N/A
Onshore Equipment					
Self-propelled modular transportation	Onshore marshalling port pre-assembly, loading, unloading activities.	1-5	N/A	N/A	N/A
Crawler crane	Onshore marshalling port pre-assembly, loading, unloading activities.	2-5	N/A	N/A	N/A
Mobile crane (2 types)	Onshore marshalling port pre-assembly, loading, unloading activities.	1-4	N/A	N/A	N/A

Vessel/Vehicle	Activity	Estimated Number of Vessels	Estimated Vessel Length (m)	Operational Speed / Maximum Speed	Annual (A) / Monthly (M) Round Trips a/
Reach stacker	Onshore marshalling port pre-assembly, loading, unloading activities.	2-4	N/A	N/A	N/A
Forklift	Onshore marshalling port pre-assembly, loading, unloading activities.	2-5	N/A	N/A	N/A
Cherry picker	Onshore marshalling port pre-assembly, loading, unloading activities.	2-4	N/A	N/A	N/A
Generators	Backup power	1-10	N/A	N/A	N/A

Notes:
a/ The numbers are indicative only of expected round trip between port and Offshore Project Area
b/ Per FAA guidance, minimum flight height at 1,700 ft

TABLE 3-22. INDICATIVE ONSHORE PROJECT VEHICLES

Vehicle	Activity
Backhoe	Foundation and duct bank installation
Box truck	Delivery of equipment and cable pulling
Bulldozer	Level site
Concrete truck	Installation of concrete
Crane	Installation of concrete structures and large equipment
Drill rig	Foundation installation
Dump truck	Soil and rock movement
Excavator	Excavate project sites
Forklift	Lift and transfer parts, tools, and/or equipment to staging area and/or Project site
Front-end loader	Soil and rock movement
HDD rig	Bore underneath shore to transition vault
Heavy duty truck	Equipment and component deliveries, miscellaneous
Manlift	Elevate workers
Tractor Trailer/flat bed	Miscellaneous
Paver	Paving of disturbed roads and new roads in the substation
Pickup truck	Crew transport, small supplies delivery, miscellaneous
Piling driving rig	Foundation installation
Skid steer	Soil and rock movement
Wheeled compactor	Foundation installation and installation of duct bank

The SouthCoast Wind team has experience with and identified best practices for offshore construction, marine logistics, and Jones Act compliance. This experience will be directly applied to all elements of the Project, to ensure compliance with the Jones Act.

See Section 13, Navigation and Vessel Traffic, and Appendix X, Navigation Safety Risk Assessment, for discussion of the proposed Project's impact on the safety of marine traffic, including USCG recommendations and requirements related to construction and operational vessels.

3.3.14.2 Operation and Maintenance

Table 3-23 and **Table 3-24** provide a list of the major vessels and vehicles required for the operation and maintenance of the proposed Project. The Project construction and O&M vessels may be operating simultaneously during the transition from construction to full operations. See **Figure 3-6** for the Project's indicative construction schedule.

TABLE 3-23. INDICATIVE OFFSHORE O&M VESSEL AND VEHICLE USE

Vessel/Vehicle	Activity	Estimated Number of Vessels	Vessel Length	Operational Speed / Maximum Speed	Annual (A) /Monthly (M) Round Trips
Maintenance Crew/CTVs	Crew and technician transfer	1-4	25–40 m	10 kn / 35 kn	100 (A) / 4 (M) a/
Multi-purpose Support Vessel/SOV	Supply and support stationed in Project Area	1	60 - 100 m	10 kn / 25 kn	24 (A) / 2 (M) a/
Anchor Handling Tugs	Cable inspection and repairs	1-2	60 m	10 kn / 15 kn	1 (A) As needed
ROV	Foundation inspections	1-2	3 m	2 kn / 5 kn	1 (A) Deployed from vessel
Heavy Lift/ Jack Up Vessel with Crane	Large scale repairs	1-2	225 m	0 kn / 12.5 kn	1 (A) As needed
Scour Vessel or Barge	Scour top-up	1	175 m	2 kn / 15 kn	1 (A) As needed
Inspection/survey vessel (Potentially ROV)	Inspection of cables or for addition geo surveys	1-2	70 - 100 m	10 kn / 14 kn	2 (A) As needed
Self-Propelled ROV/AUV	Inspections, repairs	1-2	4 m	6 kn	A (A) As needed, deployed from vessel
Helicopter	Crew support or small supply delivery	1-2	16 m	100 - 145 kn	250 (A) a/ b/
Drone	Future potential for inspection or parts delivery	1-4	1.25 m	0 – 100 mph	N/A

Notes:
a/ Numbers for annual round trip are high estimates. Actual numbers will be lower through a combination use of these three (CTV, SOV, Helicopter) different vessels.
b/ Note: Per FAA guidance, minimum flight height at 1,700 ft

TABLE 3-24. INDICATIVE ONSHORE O&M VEHICLE USE

Vessel/Vehicle	Activity
Delivery trucks	Supply transport
Support vehicles	Crew transport and supplies
Drone	Future potential for inspection or parts delivery
Crane	Installation of concrete structures and large equipment
Forklift	Lift and transfer parts, tools, and/or equipment to staging area and/or Project site
Manlift	Elevate workers

3.3.14.3 Decommissioning

Similar vessels are anticipated to be used for decommissioning as will be used for construction and installation. Vessels would likely include heavy lift vessels, heavy transport vessels, tugboats, barges, feeder barges, jack-up vessel, floating crane, crawler cranes, dredging vessels, and CTVs. Similar to the construction and installation development phase, some vessels may have generators for emergency power and provide energy storage, in the form of fuel, on board. As the decommissioning phase of the Project is anticipated to be around 35 years after construction is completed, there may be significant technology advancements which will be taken into account when creating the Project decommissioning plan.

3.3.15 Health, Safety, and Environmental Protections

SouthCoast Wind is committed to treating people, community, and the environment with care. As such, SouthCoast Wind believes that all safety and environmental incidents can be prevented; and is the foundation of the SouthCoast Wind Health Safety, Security, and Environment Policy to ensure risk is managed effectively and to uphold corporate values of honesty, integrity and respect. SouthCoast Wind has developed a Safety Management System (SMS) (see Appendix Z) which defines a comprehensive safety system that will govern all future construction and operation activities. These Safety Management Systems will be implemented and fully functional before construction activities begin, as per 30 CFR § 285.810.

Appendix Z, SMS, also includes SouthCoast Wind's Emergency Response Plan (ERP). The SouthCoast Wind ERP will outline how SouthCoast Wind will address preparedness and respond to emergency situations; and to identify the responsibilities of all parties in the event of an emergency.

Pursuant to 30 CFR § 585.627(c), SouthCoast Wind's Oil Spill Response Plan (OSRP) is included as Appendix AA. SouthCoast Wind will follow all federal, state, and local regulations pertaining to chemical and oil transfers to site, storage, removal from site, disposal, and accidental releases.

Section 15, Public Health and Safety, discusses health, safety, and environmental topics, as per 30 CFR § 585.626(b)(8) during Project deployment, construction, installation, and operations.

3.3.16 Waste Generation and Disposal

Some waste is expected to be generated by the proposed Project, see **Table 3-25**. SouthCoast Wind will abide by the Bureau of Safety and Environmental Enforcement's regulations (30 CFR § 250.300) concerning marine pollution prevention and control in OCS waters. Solid and liquid waste produced by

Project vessels during construction, operations, and decommissioning will abide by USCG regulations surrounding waste and discharge, including proper sanitary systems. A National Pollution Discharge Elimination System (NPDES) permit may be required for sections of the onshore and offshore construction. U.S. Environmental Protection Agency (EPA) New England issues NPDES permits in Massachusetts.

TABLE 3-25. WASTE AND DISCHARGES

Type of Waste or Composition	Approximate Total Amount of Discharge			Maximum Discharge Rate	Means of Storage or Discharge Method
	Const.	O&M	Decomm.		
Sewerage from Vessels	25.0–35.0 gal (94.6–132.5 L) per person per day; or, is dependent on vessel size, equipment and number of passengers			N/A	Sewage treated and discharged using USCG/ International Maritime Organization (IMO) sewage treatment system
Domestic Water	Dependent on vessel size, equipment and number of passengers			N/A	Holding tank, treated if necessary and discharged overboard, or transferred to onshore treatment center
Drilling Cuttings, Mud, or Borehole Treatment Chemicals	Dependent upon finalization of cable count, detailed trajectory design, and equipment details			As generated	Water-based, therefore discharged overboard
Uncontaminated Bilge Water	Dependent on vessel size and equipment			Dependent on vessel size and equipment	Holding tank, treated if necessary and discharged overboard, or transferred to onshore treatment center
Deck Drainage and Sumps	Dependent on vessel size and equipment			Dependent on vessel size and equipment	Treated if necessary and discharged overboard
Uncontaminated Ballast Water	Dependent on vessel size and equipment			Dependent on vessel size and equipment	Treated if necessary and discharged overboard
Solid Trash and Debris	As needed			N/A	Transferred to an onshore recycling facilities or land fill, or incinerated (if vessel is equipped with IMO-compliant trash incinerator)
Chemicals, Solvents, Oils, Greases	Dependent on vessel size and equipment			Dependent on vessel size and equipment	Transferred to permitted recycling facilities or licensed hazardous waste facilities
Cooling Water Intake Structure (non-contact cooling water)	Up to 10 MGD (during O&M only)			0.5 ft/s intake velocity	Once-through, non-contact cooling water withdrawn via seawater pumps and discharged to ambient water column

3.3.17 Chemical Use and Management

The chemical inventory for the proposed Project will align with what is typically used in offshore and onshore wind projects. A sample inventory of fuel oil, lubricant, coolants, and dielectric fluid used in WTGs and OSPs is listed in Appendix AA, Oil Spill Response Plan, as per 30 CFR Part 254. As applicable, vessels used for Project activities will follow USCG regulations concerning chemical use and management, as well as any relevant federal, state, and local regulations.

During construction, chemicals will need to be transferred to the Project Area via a designated transport vessel and will typically accompany equipment needing the specific chemical being transported. Once on site during installation, chemicals may need to be transferred from one WTG/OSP position to another depending on installation sequence and volume of chemicals held on the vessel. In terms of energy storage, some vessels may provide energy storage, in the form of fuel, and some vessels may have generators for emergency power on board. All chemicals will be transported in National Transportation Safety Council-approved containers or the manufacturer's original packaging.

During operations, all chemicals will be handled in their original manufacturer's packaging or in National Transportation Safety Council containers for initial component filling and subsequent storage. Chemical transfers are not anticipated to occur outside of component installation and/or replacement as required. Transferred quantities will be minimal.

Decommissioning of Project components may involve removing their associated chemicals. Alternatively, chemicals may be removed prior to the removal of the Project component. Removal, treatment, and disposal of any chemicals will be completed in accordance with the approved Decommissioning Plan, as well as any federal, state, and local regulations.

Health, safety, and environmental BMPs will be employed during transfers that will adhere to federal, state, and local regulations, such as 30 CFR § 250.300 (pollution prevention). The volume of chemical transferred will be contingent upon contractor needs and will be within limits pursuant to the OEM recommendations. Refer to Appendix AA, Oil Spill Response Plan, for a detailed description of SouthCoast Wind's chemical transfer process.

Table 3-26 lists potential chemicals that may be used for the proposed Project. The quantities provided are indicative of a typical wind energy project. Final quantities will be dependent upon final component selection. Any chemicals to be treated or disposed of will be transported to permitted, onshore recycling facilities or licensed hazardous waste facilities in accordance with local, state, and federal regulations.

TABLE 3-26. SUMMARY OF INDICATIVE VOLUMES OILS, FUELS, AND LUBRICANTS PER WTG AND OSP

Component and/or System	Chemical Type	Typical Volumes
WTG Bearings and yaw pinions	Grease	150 gal (570 L)
WTG Hydraulic Pumping Unit, Hydraulic Pitch Actuators, Hydraulic Pitch Accumulators, Mechanical Brake	Hydraulic Oil	200 gal (750 L)
WTG Drive Train Gearbox, Yaw Drives Gearbox	Gear Oil	600 gal (2,500 L)
WTG Transformer	Transformer Silicon/Ester Oil	2,000 gal (7,500 L)
WTG Auxiliary Power Generators	Diesel Fuel	900 gal (3,500 L)

Component and/or System	Chemical Type	Typical Volumes
WTG Tower Damper and Cooling System	Glycol/Coolants	500 gal (2,000 L)
OSP Generator	Diesel fuel	40,000 gal (150,000 L)
OSP Generator	Lubricant	450 gal (1,688 L)
OSP Generator	Cooling water (with 30% glycol)	300 gal (1,150 L)
OSP–HVAC system	Refrigerant	300 lbs (135 kg)
OSP–HVAC system	Polyester oil	50 gal (190 L)
OSP–Crane	Hydraulic oil	500 gal (1,875 L)
OSP–Transformer oil	Dielectric insulating oil	150,000 gal (570,000 L)
OSP–Electrical coating	Epoxy coating	5 gal (20 L)
OSP–Fire extinguishing agents	Foam for firefighting system	4,000 gal (15,000 L) (water/ foam concentrate)
OSP Generator	Urea	2000 gal (7,500 L)
OSP HVAC System	Propylene Glycol	4.5 m^3
OSP – Cooling Systems	30% Propylene Glycol/Water	40 m^3
OSP – Cooling Systems	Sodium Hypochlorite	5 m^3
OSP Batteries–General UPS	Sulphuric Acid	30 Ton
Batteries for Navigation light System UPS	Sulphuric Acid	264 kg
Gas insulated equipment	SF_6	10 Ton
Gas insulated equipment	SF_6	6.5 Ton
Cooling medium system	Cooling water (with 30% glycol)	50 m^3

3.3.18 Operation and Maintenance Methods

SouthCoast Wind will design, manage, and orchestrate all O&M activities for the proposed Project acting as the Project Operator, although there is a plan for some maintenance activities to be outsourced to local third-party service providers with specific expertise. There will be planned and unplanned maintenance activities during the life of the proposed Project. SouthCoast Wind will follow all applicable laws governing offshore wind energy maintenance activities and timelines.

3.3.18.1 Planned Maintenance Activities

SouthCoast Wind will coordinate major outages with the transmission system operator and ISO-NE and will inform both parties about annual maintenance schedules before each year begins to elicit feedback and make necessary adjustments. SouthCoast Wind will apply component manufacturer's recommendations in regard to maintenance activities. Tasks will have a frequency recommended such as quarterly, annually, every 3 years, etc. based on industry best practices and OEM recommendations.

On an annual basis, SouthCoast Wind will update the O&M plan whereby the production estimating, operating guidelines, maintenance plan, component sparing requirements, service provider plan, and logistics plan will be established for the next operating year. As a general practice, SouthCoast Wind will use all commercially reasonable efforts to minimize scheduled maintenance during times of peak electricity demand.

The SouthCoast Wind O&M strategy addresses maintenance of primary components including WTGs, OSPs, substructures, inter-array and export cables, and onshore substation/converter station. Planned maintenance including predictive, preventive, and corrective maintenance are key features of the O&M

plan, as well as preparation for major repairs, retrofitting, inventory, and spare parts management. Specific planned O&M activities are listed in each Project component subsection, which are located in Section 3.3.

3.3.18.2 Unplanned Maintenance

Unplanned maintenance includes any unscheduled repair or replacement which may become necessary. The SouthCoast Wind O&M team will utilize remote monitoring systems to detect failures needing repair and will deploy maintenance activities as necessary. In some instances, heavy-lift vessels are required to replace damaged or degraded major components. Unplanned maintenance execution relies upon necessary supply chains and logistics to mobilize replacement parts, tools, equipment, and personnel required to affect the repair. Warehousing spare parts and materials is supported by the permanent O&M team. As per 30 CFR § 585.626(b)(8), operating procedures and systems in place in case of accidents or emergencies is presented in Appendix Z, SMS, and Appendix AA, OSRP.

3.3.19 Conceptual Decommissioning

SouthCoast Wind will decommission the proposed Project in accordance with 30 CFR § 285.902, 30 CFR § 285.905–285.910, and 30 CFR § 285.912. After consulting with BOEM, SouthCoast Wind will submit a decommissioning application for review and approval as stated in CFR § 585.905. An approved decommissioning plan will dictate the removal of Project components and is planned to essentially reverse the construction and installation process, with the exception of the utility owned POIs and transmission lines as these components will be integrated into the reginal transmission system.

The decommission plan will comprise of several steps including but not limited to:

- Dismantling and removal of WTGs (Section 3.3.2.3);
- Cutting and removal of foundations. SouthCoast Wind will assess the removal of scour protection depending on which strategy minimizes environmental impacts (Section 3.3.1.7);
- Removal of OSP (Section 3.3.3.6);
- Retirement in place or removal of offshore cable system including offshore export and inter-array cables (Section 3.3.4.3 and 3.3.5.6); and
- Retirement in place or removal of onshore export cables, in coordination with the MA EFSB and RI EFSB (Section 3.3.7.3).

Specific descriptions of potential decommissioning activities per component are presented in Sections 3.3.1 through 3.3.11. As stated in Section 3.3.14.3, similar vessels are anticipated to be used for decommissioning as will be used for construction and installation and it is anticipated that vessel numbers and types and frequency of transits will be similar or less than those required to support construction of the Project. As the decommissioning phase of the Project is anticipated to be around 35 years after construction is completed, there may be significant technology advancements which will be taken into account when creating the Project decommissioning plan.

Unless otherwise authorized by BOEM, SouthCoast Wind will conduct a site clearance survey after decommissioning is complete to ensure that all Project components are removed, and that no unauthorized debris remains on the seabed. Details of the site clearance survey will be provided in the decommissioning plan.

Reusing and/or recycling the Project components for scrap metal or other materials will be the preferred method of disposal. Generally, decommissioning activities will have similar environmental impacts to construction and installation.

3.4 Summary of Impact-Producing Factors

Project-related activities and infrastructure elements that could produce impacts to existing conditions were identified as impact-producing factors (IPFs). The purpose of this section is to identify the duration of impact and spatial extent for each IPF to serve as a basis to evaluate the potential effects of the Project construction, O&M, and decommissioning on physical, biological, cultural, and socioeconomic resources. **Figure 3-40** illustrates how the IPFs discussed in this section are used to evaluate potential effects on resources.

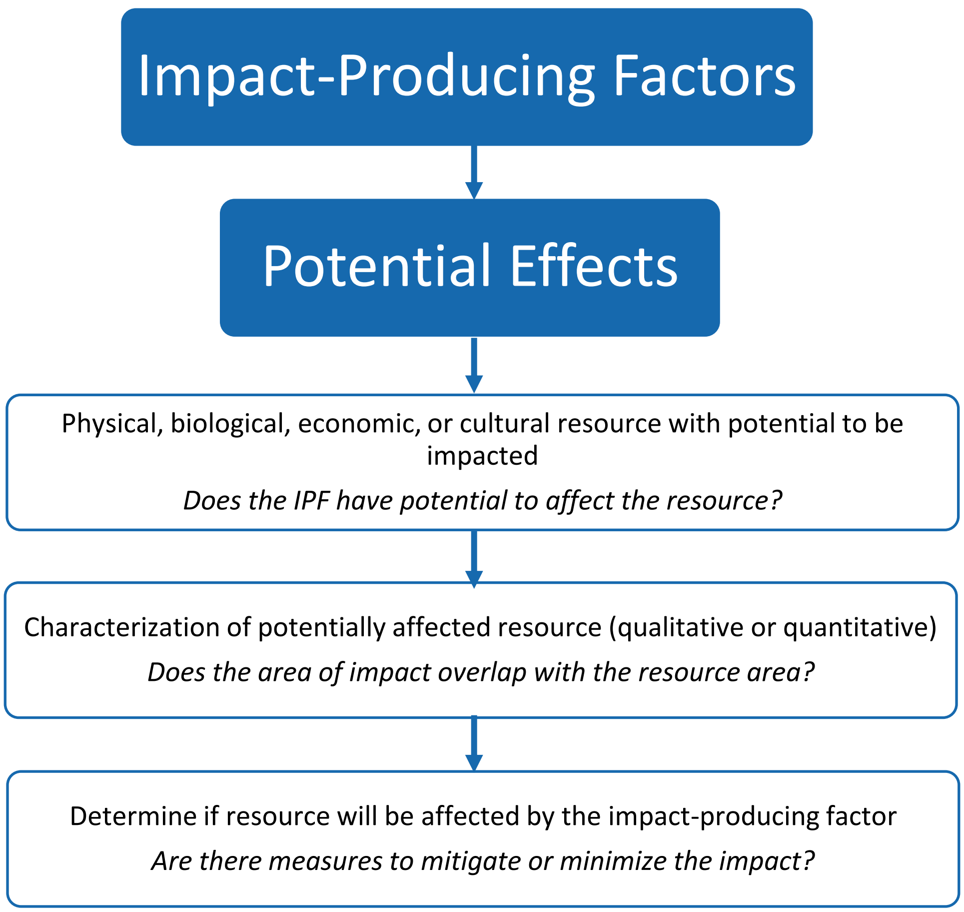


FIGURE 3-40. POTENTIAL EFFECT ON RESOURCE

BOEM's 2020 *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* identifies IPFs listed below for offshore wind projects:

- Seabed (or ground) disturbance
- Introduced sound into the environment (in-air or underwater)

- Change in ambient lighting
- Change in ambient electromagnetic fields (EMF)
- Actions that may displace biological resources, cultural resources, or human uses
- Actions that may cause direct injury or death of biological resources
- Planned discharges
- Accidental events
- Altered visual conditions
- Natural hazards
- Activities that may displace or impact fishing, recreation, and tourism
- Influx of non-local employees that could impact housing
- Activities that may cause conflict with temporal and seasonal space use by other authorized users of the coastal zone or OCS

Two of the IPFs listed above are addressed differently than others in this COP, for the reasons described below:

- **Actions that may displace biological resources, cultural resources, or human uses**–Because the actions that could displace biological resources, cultural resources, or human uses cannot be defined until evaluation of potential effects of other IPFs on resources are defined, this IPF is addressed in individual COP sections according to Project-related IPFs or activities. Displacement covers short- and long-term displacement for temporary activities and permanent displacement.
- **Actions that may cause direct injury or death of biological resources**–Because the actions that could cause injury or death cannot be defined until evaluation of potential effects of other IPFs on resources are defined, this IPF is addressed in individual COP sections according to Project-related IPFs or activities. Direct injury includes non-lethal but severe injuries that may indirectly result in death or short-term impairment but not result in death.

A summary of IPFs and their corresponding sections within the COP can be found in **Table 3-27**. In addition to the BOEM IPFs, supplementary IPFs have been identified and included by SouthCoast Wind to accurately represent resources the proposed Project may encounter. For the purposes of this section, the worst-case scenario of the PDE is considered for a conservative estimate of the potential impacts associated with the proposed Project.

TABLE 3-27. SUMMARY OF IMPACT-PRODUCING FACTORS ASSOCIATED WITH THE PROPOSED PROJECT

IPF	Physical Resources				Biological Resources									Cultural Resources				Acoustic Resources		Socioeconomic Resources							
	Site Geology and Environmental	Physical Oceanography and	Air Quality	Water Quality	Coastal and Marine Birds	Bat Species	Terrestrial Vegetation and Wildlife	Wetlands and Waterbodies	Coastal Habitats	Benthic and Shellfish Resources	Finfish and Invertebrates	Marine Mammals	Sea Turtles	Marine Archaeological Resources	Terrestrial Archaeological Resources	Above-Ground Historic Properties	Visual Resources	In-Air Acoustic Environment	Underwater Acoustic Environment	Demographics and Employment, and Economics	Environmental Justice, Minority and Lower Income Groups and	Recreation and Tourism	Commercial and Recreational Fishing	Zoning and Land Use	Navigation and Vessel Traffic	Other Marine Uses	Public Health and Safety
Section Number	**4.1**	**4.3**	**5.1**	**5.2**	**6.1**	**6.2**	**6.3**	**6.4**	**6.5**	**6.6**	**6.7**	**6.8**	**6.9**	**7.1**	**7.2**	**7.3**	**8.0**	**9.1**	**9.2**	**10.1**	**10.2**	**10.3**	**11.0**	**12.0**	**13.0**	**14.0**	**15.0**
Seabed (or ground) disturbance	X	X		X	X	X	X	X	X	X	X	X	X	X	X												
Introduced sound into the environment (in-air or underwater)					X	X	X			X	X	X	X					X	X					X			
Change in ambient lighting					X	X	X		X		X					X	X								X	X	
Change in ambient EMF						X	X		X	X	X		X														
Actions that may displace biological resources, cultural resources, or human uses a/					X	X			X	X	X	X	X	X						X	X	X	X	X	X		
Actions that may cause direct injury or death of biological resources b/					X	X	X		X			X	X														
Planned discharges			X	X	X		X	X	X	X	X	X	X								X	X		X			
Accidental events				X	X		X	X	X	X	X	X	X		X									X	X		X
Altered visual conditions																X	X								X		
Natural hazards				X																							
Activities that may displace or impact fishing, recreation, and tourism																						X	X		X		
Influx of non-local employees that could impact housing																				X	X	X					
Activities that may cause conflict with temporal and seasonal space use by other authorized users of the coastal zone or OCS																				X				X		X	

Notes:

a/ Because disturbance is speculative and cannot be defined until effect assessments have been completed, IPF is addressed in individual COP sections according to specific Project-related IPFs or activities.

b/ Because injuries/death are speculative and cannot be identified until effect assessments have been completed, IPF is addressed in individual COP sections according to specific Project-related IPFs or activities.

3.4.1 Seabed (or Ground) Disturbance

Seabed disturbance will occur in the Lease Area and offshore export cable corridors, resulting from installation and maintenance of export and inter-array cables, substructures for WTGs and OSPs, and associated vessel activities. Onshore ground disturbance will result from all construction activities involving excavation or placement of infrastructure. Specific activities related to seafloor and land disturbance are broken down by Project phase and listed in **Table 3-28**. The magnitude of the disturbance will depend on the affected area, equipment used, and the seabed or ground material on site.

TABLE 3-28. SEAFLOOR AND LAND DISTURBANCE–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Seabed (or ground) disturbance	Construction	Seabed preparation
		Offshore export cable/inter-array cable installation
		Foundation installation
		Placement of scour protection
		Construction vessel anchoring/installation vessel jack-up legs
		Onshore construction (ground disturbance)
	O&M	Maintenance of cables
		O&M vessel anchoring
	Decommissioning	Decommissioning-WTG/OSP foundations and cables (if required)
		Decommissioning vessel anchoring

3.4.1.1 Offshore Export Cable and Inter-Array Cable Installation

Activities to be performed during construction and decommissioning of the proposed Project with potential to disturb the seabed or ground listed in **Table 3-28** are discussed in the following sections. Additional details on activities and design parameters for the proposed Project can be found in Section 3.3.

3.4.1.1.1 Seabed Disturbance–Seabed Preparation and Cable Burial

Cable installation and pre-lay seabed preparation methods that could be used are described in Section 3.3. As discussed in Section 3.3, the seafloor may require preparation, including leveling, sand wave removal, and boulder removal, prior to installing cables. An orange peel grabber may be used for localized boulder removal and a plow may be used for boulder field removal. If sand waves are present, the tops may need to be removed to provide a level bottom to install the export cable. Removal of sand waves can be conducted using a trailing suction hopper dredger, a water-injection dredge in shallower areas, or constant flow excavators.

The disturbance to the seabed from cable installation will include the trench footprint, the area surrounding the trench where sediment suspended during installation will settle, and the footprint of any cable protection, such as mattresses. See Section 3.3.4.1.3 for cable protection methods under consideration. Additionally, for areas where anchoring may be required, anchor impacts have been considered.

Based on currently available information on the proposed Offshore Project Area, the percentage of the export cable corridors that may require each type of seabed preparation method, cable installation method, and cable protection was estimated on a preliminary basis. This was then used to estimate the total potential area of seafloor disturbance during export cable construction and decommissioning. These estimates are summarized in **Table 3-29** with area of disturbance measured in acres and hectares.

TABLE 3-29. EXPORT CABLE–ESTIMATED SEABED DISTURBANCE AREAS

Offshore Export Cable	Area in ac (ha) per Cable
Falmouth Export Cable	
Seabed Preparation a/ (per cable)	11 (4)
Cable Installation b/ (per cable)	186 (75)
Cable Protection c/ (per cable)	27 (11)
Total Seabed Disturbance Area (per cable)	351 (142)
Number of Cables	Up to 5
Total Seabed Disturbance Area (5 cables)	1,753 (709)
Brayton Point Export Cable	
Seabed Preparation d/ (per cable bundle)	10 (4)
Cable Installation b/ Installation e/ (per cable bundle)	242 (98)
Cable Protection f/ (per cable bundle)	56 (23)
Total Seabed Disturbance Area (per cable bundle)	363 (147)
Number of Cable Bundles	Up to 2
Total Seabed Disturbance Area (2 cable bundles)	727 (294)

Notes:

a/ Seabed preparation includes sand wave clearance via trailing suction hopper dredger (or similar) over approximately five percent of the Falmouth cable route, and boulder field clearance, as well as local boulder removal via boulder grabs in other locations. Sand wave and boulder field clearance is expected to be needed primarily in areas of the offshore export cable corridor traversing Muskeget Channel and Nantucket Sound. It is also assumed that a grapnel run may be performed along the entire length of the cable route (route length up to 87.0 mi [140 km]).

*b/ Cable installation assumes cable burial along the entire Falmouth offshore export cable route via one of the several methods under consideration (**Table 3-17**), and conservatively assumes a width of surface impact of 19.7 ft (6 m) around each cable. Anchor impacts are considered as well—it is assumed that an anchored vessel will be used in the shallower sections of the cable route (approximately 30 percent of the cable route, **Figure 3-29**) The area of impact due to anchoring assumes that an 8-point mooring spread is used, with an estimated impact diameter of 16.4 ft (5 m) per anchor.*

d/ Seabed preparation includes boulder field clearance over approximately 10 percent of the Brayton Point offshore export cable route, as well as local boulder removal via boulder grabs in other locations. It is also assumed that a grapnel run will be performed along the entire length of the cable route (route length up to 124 mi [200 km]).

*e/ Cable installation assumes cable burial along the entire Brayton Point offshore export cable route via one of the several methods under consideration (**Table 3-17**), and conservatively assumes a width of surface impact of 19.7 ft (6 m) around each cable. Anchor impacts are considered as well—it is assumed that an anchored vessel will be used in the shallower sections of the cable route (approximately 15 percent of the cable route, see **Figure 3-30** above). The area of impact due to anchoring assumes that an 8-point mooring spread is used, with an estimated impact diameter of 16.4 ft (5 m) per anchor.*

f/ Cable protection assumes mattresses and/or rock placement will be used at cable crossings and for additional cable protection along the Brayton Point offshore export cable route if needed. Based on preliminary understanding of site conditions from desktop studies of the offshore export route, SouthCoast Wind estimates 15 percent of the route will require additional cable protection. It is assumed that a 19.7 ft (6 m) wide rock berm will be constructed along these sections of the cable. At each of up to 16 third-party cables expected to be crossed, rock berms and/or a number of 9.8 ft (3 m) width x 19.7 ft (6 m) length mattresses are assumed to be used for cable separation and protection.

Seabed disturbance from the inter-array cables was estimated and is summarized in **Table 3-30**.

TABLE 3-30. INTER-ARRAY CABLE—ESTIMATED SEABED DISTURBANCE AREAS

Inter-Array Cable Total	Area in ac (ha)
Seabed Preparation a/	99 (40)
Cable Installation b/	1,186 (480)
Cable Protection c/	122 (50)
Total Area Disturbed	**1,408 (570)**

Notes:

a/ Seabed preparation includes local boulder removal via boulder grabs. Sand wave and boulder field clearance is not expected in the lease area in preparation for inter-array cable installation. It is assumed that a grapnel run will be performed along the entire length of the inter-array cable layout (up to 497.1 mi [800 km]).

*b/ Cable installation assumes cable burial along the entire inter-array cable layout via one of the several methods under consideration (**Table 3-13**), and conservatively assumes a width of surface impact of 19.7 ft (6 m) around each cable. It is not expected that anchored vessels will be used for the inter-array cable installation.*

c/ Cable protection assumes mattresses and/or rock placement will be used at cable crossings and for additional cable protection along the inter-array cable layout if needed. Based on preliminary understanding of site conditions from surveys completed in 2019 and 2020, SouthCoast Wind estimates 10 percent of the inter-array cable layout will require additional cable protection. It is assumed that a 19.7 ft (6 m) wide rock berm will be constructed along these sections of the cable.

The area surrounding the Falmouth offshore export cable that could be affected by re-sedimentation of sediment suspended during installation was estimated using a model described in Appendix F1, Sediment Plume Impacts from Construction Activities and Appendix F3, Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment. Results are summarized in **Table 3-31** for the Falmouth offshore export cable and **Table 3-32** for the Brayton Point offshore export cable.[5] The modeling evaluated three segments of the Falmouth export cable corridor (Appendix F1) and two segments of the Brayton Point export cable corridor (Appendix F3) identified based on sediment characteristics that influence sediment suspension and dispersion (primarily grain size).

[5] The two modeling analyses evaluated sediment suspension concentrations at varying but similar thresholds in the water columns.

TABLE 3-31. ESTIMATED AREA OF REDISPOSITION OF MATERIAL SUSPENDED DURING EXPORT CABLE INSTALLATION - FALMOUTH

	Nantucket Sound a/		Muskeget Channel b/		Southern Export Cable Route c/	
Deposition thickness threshold in (cm)	Maximum observed distance from installation ft (m)	Area of deposition exceeding threshold ac (ha)	Maximum observed distance from installation ft (m)	Area of deposition exceeding threshold ac (ha)	Maximum observed distance from installation ft (m)	Area of deposition exceeding threshold ac (ha)
0.01 (0.02)	3,126 (953)	301.5 (122)	2,365 (721)	437.4 (177)	2,378 (725)	857.5 (347)
0.02 (0.05)	2,289 (698)	217.5 (88)	1,437 (438)	321.2 (130)	1,738 (530)	625.2 (253)
0.04 (0.1)	1,653 (504)	165.6 (67)	620 (189)	239.7 (97)	1,174 (358)	496.7 (201)
0.20 (0.5)	72.2 (22)	113.7 (46)	108.2 (33)	158.1 (64)	288.6 (88)	279.2 (113)
0.39 (1)	55.8 (17)	96.4 (39)	88.6 (27)	133.4 (54)	85.3 (26)	212.5 (86)
1.97 (5)	29.5 (9)	222.4 (90)	52.5 (16)	54.4 (22)	32.8 (10)	16.8 (6.8)
3.94 (10)	N/A	0	N/A	0	N/A	0

Source: Appendix F1 Sediment Plume Impacts from Construction Activities
Notes:
a/ Nantucket Sound portion of the offshore ECC is defined as Kilometer Point (KP)0 to KP 20
b/ Muskeget Channel portion of the offshore ECC is defined as KP20 to KP45
c/ Southern Export Cable Route of the offshore ECC is defined as KP45 to KP88

TABLE 3-32. ESTIMATED AREA OF REDISPOSITION OF MATERIAL SUSPENDED DURING EXPORT CABLE INSTALLATION – BRAYTON POINT

Deposition thickness threshold in (cm)	Mount Hope Bay a/		Sakonnet River Area b/		Offshore Sakonnet Area c/		Offshore Martha's Vineyard Area d/	
	Maximum observed distance from installation ft (m)	**Area of deposition exceeding threshold ac (ha)**	**Maximum observed distance from installation ft (m)**	**Area of deposition exceeding threshold ac (ha)**	**Maximum observed distance from installation ft (m)**	**Area of deposition exceeding threshold ac (ha)**	**Maximum observed distance from installation ft (m)**	**Area of deposition exceeding threshold ac (ha)**
0.02 (0.05)	875 (267)	224.9 (91)	662 (202)	313.8 (127)	289 (88)	331.1 (134)	289 (88)	331.1 (134)
0.04 (0.10)	407 (124)	103.8 (42)	528 (161)	143.3 (58)	194 (59)	237.2 (96)	194 (59)	237.2 (96)
0.06 (0.15)	279 (85)	69.2 (28)	400 (122)	106.2 (43)	151 (46)	229.8 (93)	151 (46)	229.8 (93)
0.08 (0.20)	210 (64)	54.4 (22)	285 (87)	96.4 (39)	102 (31)	227.3 (92)	102 (31)	227.3 (92)
0.20 (0.50)	49.2 (15)	29.6 (12)	78.7 (24)	86.5 (35)	<32.8 (<10)	200.2 (81)	<32.8 (<10)	200.2 (81)
>0.39 (>1.00)	<32.8 (<10)	2.5 (1)	<32.8 (<10)	49.4 (20)	<32.8 (<10)	17.3 (7)	<32.8 (<10)	17.3 (7)

Source: Appendix F3 Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment

Notes:

a/ Mount Hope Bay portion of the offshore ECC is defined as KP0 to KP10

b/ Sakonnet River Area portion of the offshore ECC is defined as KP15 to KP34

c/ Offshore Sakonnet Area portion of the offshore ECC is defined as KP34 to KP78

d/ Offshore Martha's Vineyard Area portion of the offshore ECC is defined as KP78 to K152

The Falmouth model was also run to estimate the area of dispersion and re-sedimentation from the installation of the inter-array cable, summarized in **Table 3-33.**

TABLE 3-33. ESTIMATED AREA OF REDISPOSITION OF MATERIAL SUSPENDED DURING INTER-ARRAY CABLE INSTALLATION

Deposition thickness threshold in (cm)	Maximum observed distance from installation ft (m)	Area of deposition exceeding thickness threshold ac (ha)
0.01 (0.02)	2,414 (736)	1,329 (538)
0.02 (0.05)	1,496 (456)	852.5 (345)
0.04 (0.1)	1,214 (370)	627.6 (254)
0.20 (0.5)	590.4 (180)	311.4 (126)
0.39 (1)	223 (68)	187.8 (76)
1.97 (5)	23 (7)	0 (0.02)
3.94 (10)	N/A	0

An assessment of scour potential for the export and the inter-array cables, based on field data and review of existing information, is discussed in the Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure. Sediment mobility potential across the Lease Area is very small and no significant scour impact is expected from the inter-array cables. In areas where the export cables are buried, scour could develop as a result of natural processes and not the presence of the cable (Appendix F2, Scour Potential Impacts from Operational Phase and Post-Construction Infrastructure). As discussed in Section 3.3, secondary cable protection (including for scour protection if needed) may be used along certain portions of the export cables and inter-array cables. If cables and cable protection are removed during decommissioning, seabed disturbance is anticipated to be similar to construction.

3.4.1.1.2 Seabed Disturbance–Horizontal Directional Drilling

HDD will be used to avoid seabed and ground surface disturbance in the nearshore and shoreline areas for the sea-to-shore transitions. See Section 3.3.6 for additional information on HDD activities. Seabed disturbance from HDD will be limited to the area where the HDD exits, within the nearshore area. **Table 3-34** and **Table 3-35** lists the anticipated area that will be disturbed at the HDD exit. If the submarine cable systems are to be removed for decommissioning, seabed disturbance similar to installation is anticipated.

TABLE 3-34. AREA OF DISTURBANCE AT HDD EXIT PIT—FALMOUTH

Sea-to-Shore HDD	Area Disturbed, ac (ha)
Exit Pit / Cofferdam (per HDD) a/	0.10 (0.04)
Number of HDDs	Up to 4
Total Area Disturbed (4 HDDs)	**0.40 (0.16)**

Note:
a/ Assumes a 65.6 ft (20 m) width by 65.6 ft (20 m) length exit pit or cofferdam may be constructed at each HDD exit offshore.

TABLE 3-35. AREA OF DISTURBANCE AT HDD EXIT PIT–BRAYTON POINT / AQUIDNECK ISLAND

Sea-to-Shore HDD	Area Disturbed, ac (ha)
Exit Pit / Cofferdam (per HDD) a/	0.30 (0.12)
Number of HDDs	Up to 12
Total Area Disturbed (4 HDDs)	**1.20 (0.48)**

Note:
a/ Assumes a 65.6 ft (20 m) width by 65.6 ft (20 m) length exit pit or cofferdam will be constructed at each HDD exit offshore.

3.4.1.2 Substructure Installation

As discussed in Section 3.3.1, three substructure types are included in the PDE for both the OSPs and the WTGs. Monopiles and pin-pile jacket foundations would be installed using pile driving methods. Suction-bucket jacket substructures would utilize techniques that do not involve pile driving but would likely require seabed preparation. The seafloor will be disturbed within the footprint of the foundation and scour protection placed around the foundation, and in the immediately adjacent area during installation, depending on installation methodology and vessels used.

The potential for scour at foundations was evaluated by modeling hydrodynamics and scour/erosion potential within the Lease Area; methods and results are provided in Appendix F2. Scour at monopile and pin-pile jacket foundation types was quantified through the model, and the potential for scour at other PDE foundation types was estimated based on these results. Results of the modeling will be considered for final design of scour protection at WTG and OSP foundations.

Table 3-36 lists the seabed disturbance from OSP substructures for foundations and scour protection footprints which would occur during both construction and over the operational phase of the Project, and the additional temporary disturbance from construction phase seafloor preparation. **Table 3-37** lists the seabed disturbance from WTG substructures within the foundation and scour protection footprint. Examples of scour protection that may be used is included in Section 3.3.1.9.

There will be a maximum of 149 positions, with up to 147 WTGs and up to 5 OSPs. Worst case impacts were assessed with 147 WTGs and 2 OSPs to depict a scenario for the largest expected area of seabed disturbance.

TABLE 3-36. MAXIMUM DISTURBANCE FOOTPRINT AREA—OSP SUBSTRUCTURES

Disturbance	Pin-Pile Jacket
Construction and Operational Phase–Disturbance from OSP foundation footprint including scour protection, ac (ha)	
Per OSP Substructure	9.8 (3.7)
Up to (2 OSP Substructures)	19.6 (7.4)
Additional Temporary Disturbance from seafloor preparation during construction, ac (ha)	
Per Substructure	0.5 (0.2)
Up to (2 Substructures)	1.0 (0.4)

TABLE 3-37. MAXIMUM DISTURBANCE FOOTPRINT AREA—WTG SUBSTRUCTURES

Disturbance	Monopile	Pin-Pile Jacket	Suction-Bucket Jacket
Construction and O&M Phase–Disturbance from WTG foundation footprint incl. scour protection, ac (ha)			
Per WTG Substructure	2.52 (1.02)	2.61 (1.05)	4.90 (1.98)
Up to (147 WTG Substructures)	370.44 (149.94)	383.67 (154.35)	578.32 (233.4) a/
Additional Temporary Disturbance from seafloor preparation during construction, ac (ha)			
Per Substructure	0.5 (0.2)	0.5 (0.2)	0.6 (0.3)
Up to (147 Substructures)	73.5 (29.4)	73.5 (29.4)	82 (37.9) a/
Note: *a/ Scenario assumes maximum 85 Suction-Bucket Jacket substructures*			

During decommissioning, substructures that required pile driving for installation, i.e., monopiles and pin-piled jackets, will be cut at an approved depth within the subsurface and subsequently pulled out of the seabed. Suction-bucket substructures may require pumps to allow them to be more easily removed from their position suctioned to the seabed.

3.4.1.3 Vessel Anchoring–Construction, Operation, and Decommissioning

Vessels required for the construction phase of the proposed Project could anchor at various locations throughout the proposed Offshore Project Area including the Lease Area and offshore export cable corridor. Anchoring, including anchor chain sweep, will result in shallow drags in seafloor sediment. Jack-up vessels and heavy-lift barges will also disturb the seafloor within the footprint of the spuds. Disturbances will vary in magnitude as a result of several factors including: wave and current conditions, anchor size, seafloor characteristics at the anchoring site, and vessel drag distances.

The footprint of the jack-up vessel spuds on the seafloor is estimated at 0.37 ac (0.15 ha) per jack-up vessel (including all jack-up legs). During installation, there may be 6 to 8 vessel visits for the WTG locations and four visits to OSPs. The total seafloor area that could be affected is listed in **Table 3-38**.

Seabed disturbance from vessel anchoring during the decommissioning phase is anticipated to be of the same magnitude as the construction phase when similar vessels will be required.

TABLE 3-38. MAXIMUM DISTURBANCE FOOTPRINT AREA–ANCHORING

Jack-up Vessel Spuds–Seabed Footprint	Footprint Area in ac (ha)
Spud footprint area per jack-up vessel	0.37 (0.15)
Construction	
Jack-up visits per WTG/OSP during construction	6 to 8
Total seabed footprint area (149 WTG/OSP)	441.8 (178.8)

3.4.1.4 Onshore Cable and Infrastructure

3.4.1.4.1 Construction (Ground Disturbance)

Construction of the onshore export cable and other onshore infrastructure is described in Section 3.3. Ground disturbance from onshore construction involves site clearing, excavation, and filling as a result of HDD and transition joint bays construction, onshore underground export cable installation, construction of an onshore substation and HVDC converter stations and underground transmission installation. Ground disturbance will be localized to the immediate vicinity of construction and will cease upon conclusion of construction activities. Decommissioning of onshore facilities, as discussed in Section 3.3, will be decided upon local and state stakeholder engagement. The proposed Project footprint areas of disturbance are listed in **Table 3-39**.

TABLE 3-39. AREA OF DISTURBANCE–ONSHORE TRANSMISSION CONSTRUCTION

	Component	Description	Number	Total Area (ac)	Total Area (ha)
Falmouth Interconnection a/	Onshore Cables (Export and Underground Transmission)	**Permanent Impacts Only**			
		Transition joint bay (installed)	4 TJBs	0.066	0.027
		Maximum case duct bank (direct buried duct bank arrangement 12 ducts)	9' 8" wide, 8.5 mi route	10.0	4.0
		Buried splice vault (installed)	20 locations along route, 3 vaults per location	0.4	0.2
		Temporary and Permanent Impacts			
		Maximum case landfall construction (Shore St- Transition joints included)	-	0.91	0.37
		Trench excavation area along duct bank route	12 ft wide, 8.5 mi route	12.4	5.0
		Splice vault work area	20 locations along route, 0.5 ac per location	10.0	4.0
	Onshore Substation	**Temporary and Permanent Impacts**			
		Fenced in substation yard and work area		26	10.5
		Total of Temporary and Permanent Impacts		**49.3**	**20.0**
Brayton Point Interconnection	Onshore HVDC Export Cables (Aquidneck and Brayton Point)	**Permanent Impacts Only**			
		Maximum case duct bank (split duct bank, 4 power conduits)	5' 8" wide, 2.6 mi of routing	1.8	0.7
		Buried TJBs and splice vaults (installed)	10 locations along route, 2 vaults per location	0.14	0.06
		Temporary and Permanent Impacts			
		Landfall construction area	3 sites, assuming 1 acre per site	3.0	1.2
		Trench excavation area along duct bank route (split duct bank installation)	8' 8" side, 2.6 mi of routing	2.7	1.1
		Buried transition and splice vault work area	10 locations along route, 500 sq. ft. per location	0.11	0.05
	Converter Stations b/	**Permanent Impacts Only**			
		Approximate area for fenced in substation yards		7.5	3.0
		Temporary and Permanent Impacts			
		Fenced in substation yards and work area		10	4.0

	Component	Description	Number	Total Area (ac)	Total Area (ha)
	Brayton Point HVAC Underground Transmission	**Permanent Impacts Only**			
		Duct bank	9’ 8” wide, 0.2 mi route	0.2	0.1
		Temporary and Permanent Impacts			
		Trench excavation area along duct bank route	12 ft wide, 0.2 mi route	0.3	0.1
		Total of Temporary and Permanent Impacts		**16.1**	**6.5**

Notes:
a/ if Falmouth is selected as the POI for Project 2
b/ area per component

3.4.1.5 Operations and Maintenance

Onshore ground could be disturbed during the O&M phase for similar non-routine maintenance required for repairs along the route. This disturbance would also be localized to the direct vicinity of the maintenance and be returned to a covered state after the repair is concluded.

Where practicable, vegetation within approximately 50 ft (15.2 m) of the onshore substation and converter station fence will be maintained to knee level or lower using a lawn mower, string trimmer, pruner, hedge trimmer, or similar based on final landscaping plans. The Project will not conduct vegetation maintenance outside of the property or lease boundary. Planting and maintenance plans will account for the safety, security, and visual screening needs of the Project. Similar vegetation maintenance practices will be followed along any underground cable easements outside of paved roadway. Vegetation, where present, will be maintained to knee level or lower along a corridor up to 35 ft (10.7 m) in width to protect the cables from potential damage due to large root systems.

3.4.2 Introduced Sound into the Environment (In-Air or Underwater)

Introduced sounds as a result of construction, operation, and decommissioning of the proposed Project will either travel in-air or underwater. Introduced sound has the potential to affect wildlife or human activities. How the introduced sound is experienced by wildlife or humans depends on the sound source, frequency, distance between the sound source and the receiver, hearing capability of the receiver, and environmental factors present including if the sound is in-air or underwater. A full discussion of modeled results for in-air sound can be found in Section 9.1, In-Air Acoustics, with additional details presented in Appendix U1, In-Air Acoustic Assessment. Underwater sound is covered in Section 9.2 Underwater Acoustics, and further detailed in Appendix U2, Underwater Acoustic Assessment.

Specific activities related to introduced sound are listed in **Table 3-40**.

TABLE 3-40. INTRODUCED SOUND–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Introduced sound into the environment (in-air or underwater)	Construction	WTG/OSP foundation installation
		Vessel/equipment operation during construction
		Onshore construction vehicles
	O&M	WTG operation
		Onshore substation/converter station operation
		Vessel, vehicle, aircraft operation
	Decommissioning	Vessel/equipment operation during decommissioning.

3.4.3 Changes in Ambient Lighting

Changes to ambient lighting will occur throughout all phases of the proposed Project, onshore and offshore. These changes include increases in lighting for construction and decommissioning operations and ambient lighting fixed to the WTGs, OSPs, onshore substation, and converter stations during the operational life of the proposed Project. O&M port facilities are expected to use existing port facilities with no change in ambient lighting. The effect of a change to ambient lighting depends on the light source, duration, location, and position. Specific activities related to changes in ambient lighting are listed in **Table 3-41**.

TABLE 3-41. CHANGES IN AMBIENT LIGHTING–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Changes in Ambient Lighting	Construction	WTG, OSP, inter-array cable, and export cable construction lighting
		Onshore construction lighting (night)
	O&M	Aviation obstruction lighting for offshore Project components
		Onshore substation/HVDC converter station security lighting
	Decommissioning	Decommissioning equipment lighting for night operations

3.4.3.1 Construction and Decommissioning

3.4.3.1.1 Offshore Lighting

Additional lighting for night operations may be necessary within the Lease Area and export cable corridors during construction and decommissioning. Lighting will follow IALA, USCG, and BOEM requirements for lighting during construction. These operations include installation and removal of WTGs, OSPs, inter-array cables, and export cables. During construction, cranes, and offshore structures will be illuminated and marked per applicable USCG, FAA, or local requirements. This magnitude of lighting is temporary and will not be present during the operational phase of the proposed Project.

3.4.3.1.2 Onshore Lighting

Additional lighting maybe required during onshore construction activities. Much like offshore lighting, additional onshore lighting for construction will be temporary.

For the onshore substation and converter stations, SouthCoast Wind will ensure the lighting scheme complies with Town requirements. Outdoor light fixtures are typically light-emitting diode holophane type fixtures equipped with light shields to prevent light from encroaching into adjacent areas. Light shields may be rotated within fixtures to the most effective position for keeping light overflow from leaving the site. The design will work to comply with night sky lighting standards to the extent practicable. It is noted that under certain ground cover conditions (i.e., snow cover), down-shielded lighting would increase light dome and atmospheric (clouds, haze, fog) reflections. There are typically a few lights illuminated for security reasons on dusk–to-dawn sensors as well as a few on motion-sensing switches, depending on the application needed for the site. The majority of lights will be switched on for emergency situations only and would not be used on a regular basis. Task lighting during construction and maintenance activities will only be used as needed and manually switched on.

3.4.3.2 Operations and Maintenance

3.4.3.2.1 Offshore Aviation Obstruction Lighting

Each WTG and OSP will be affixed with lighting, causing changes to ambient lighting during the operational phase of the proposed Project. During the day, the WTGs and OSP do not require additional lighting but at night the structures must be visible to aircraft pilots and mariners navigating in water.

Additional information regarding marking and lighting of the WTGs and OSP can be found in Section 3.3.12, Marking and Lighting, and Appendix Y3 ADLS Efficacy Analysis. Details regarding offshore aviation and warning lighting are presented in Appendix Y3, ADLS Efficacy Analysis. ADLS will be implemented and an ADLS will be activated for a total of four minutes and 46 seconds per year for the proposed Project within the Lease Area. Use of ADLS by the Project will be subject to technical feasibility, commercial availability, and agency review and approval, including approval from DoD.

3.4.3.2.2 Onshore Substation and HVDC Converter Station Security Lighting

The onshore substation and converter stations will require use of security lighting during the operational life of the proposed Project. This will create a safe environment for individuals required to facilitate any maintenance, scheduled or unscheduled, in low light conditions. This will cause a change in ambient lighting within the vicinity of the onshore substation/converter stations.

For the onshore substation and converter stations, SouthCoast Wind will ensure the lighting scheme complies with Town requirements. Outdoor light fixtures are typically light-emitting diode holophane type fixtures equipped with light shields to prevent light from encroaching into adjacent areas. Light shields may be rotated within fixtures to the most effective position for keeping light overflow from leaving the site. The design will work to comply with night sky lighting standards to the extent practicable. It is noted that under certain ground cover conditions (i.e., snow cover), down-shielded lighting would increase light dome and atmospheric (clouds, haze, fog) reflections. There are typically a few lights illuminated for security reasons on dusk–to-dawn sensors as well as a few on motion-sensing switches, depending on the application needed for the site. The majority of lights will be switched on for emergency situations only and would not be used on a regular basis. Task lighting during construction and maintenance activities will only be used as needed and manually switched on.

3.4.4 Changes in Ambient Electric and Magnetic Fields

Electric and magnetic fields exist in ambient levels everywhere on earth. EMF levels can be steady or slowly varying, called DC fields, or can vary over time, called AC fields. Earth's core creates a steady DC EMF that can be demonstrated with a compass needle. The known size of Earth's EMF along the southern New England coast is 516 milligauss (mG; CSA Ocean Sciences Inc. and Exponent, 2019). EMF are produced by electrically charged objects, including cabling systems. Since EMF have a direct relationship to the presence of an electric charge, changes in EMF as a result of the proposed Project are only connected to the operational phase. Onshore and offshore EMF studies were conducted for the proposed Project Area to model changes in EMF from known parameters from the Project. Additional details regarding models and studies performed on submarine EMF and EMF in the onshore transmission system can be found in Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project. Information regarding EMF effects from HVDC transmission can be found in Appendix P2, High Voltage Direct Current Electric and Magnetic Field (EMF) Assessment. Specific activities related to changes in ambient electromagnetic fields are listed in **Table 3-42**.

TABLE 3-42. CHANGES IN AMBIENT EMF–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Changes in ambient EMF	O&M	Operations of export cables and inter-array cables
		Operation of transmission lines

3.4.4.1 Operations and Maintenance

3.4.4.1.1 Operation of Submarine Cables

The strength of EMFs from electrical transmission lines is directly proportional to the voltage and current. Additionally, EMF levels from submarine cables vary by cable design and cable burial depth. The three-core 60 to 72.5 kV inter-array cables are anticipated to be buried up to 8.2 ft (2.5 m). The nominal 200-345 kV HVAC and ±320-525 kV HVDC export cables are anticipated to be buried up to 13.1 ft (4.0 m). The internal conductors are separated by layers of insulation and sheathing then surrounded by outer layers of additional insulation and steel wire armoring.

EMFs generated from HVAC submarine cables drop off rapidly with lateral and vertical distance from the cables. Burial depth is a key factor in affecting EMF levels at the seafloor. A cable buried at 6.6 ft (2.0 m) below the seafloor sees a four-fold reduction in seafloor EMF levels compared to a cable buried at 3.3 ft (1.0 m). As displayed in the results in **Table 3-43**, the difference in EMF levels between 10.0 ft (3.0 m) and 25 ft (7.6 m) away from the submarine cable is dramatically different. Cases modeled and listed in Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project, highlight how EMF at different burial depths, cable separations, cable voltages, and cable currents. The modeling is based on 275 kV operating voltage as the operating voltage for normal operation will be nominally 275 kV but can fluctuate up to 300 kV depending on operating parameters. The maximum current assumed for the purpose of the study is set by the thermal capacity of the cable, which is unrelated to operating voltage. The results per modeled case for the export cable are listed in **Table 3-43**. The full EMF assessment for submarine cables can be found in Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project.

An HVDC EMF assessment is provided in Appendix P2, however no modeling has been conducted at this time. In summary, scientists have not found any confirmed health risks for the weak static EMFs associated with HVDC power transmission.

TABLE 3-43. HVAC SUBMARINE EXPORT CABLE EMF MODELING RESULTS

Case	Maximum Magnetic Field (mG) above Cable Centerline	Magnetic Field (mG), ± 10 ft (3 m) from Cable Centerline	Magnetic Field (mG), ± 25 ft (7.6 m) from Cable Centerline
Seabed–Likely (6.6 ft [2 m] burial depth)	87.9	29.3	6.6
Seabed–Worst (laid on surface)	2,168	44.6	7.5
Landfall Location (at transitional vault)	315	38.1	6.7
Landfall Location (land-side edge of beach)	6.1/5.0	6.0	4.3
Landfall Location (middle of beach)	4.3/3.4	4.2	3.5

Source: Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project

3.4.4.1.2 Operation of Underground Export and Interconnection Cables

Much like submarine cables, EMF produced by onshore export cables and underground interconnection cables will directly relate to the voltage and current present. The highest modeled EMF levels for the HVAC underground duct bank cross sections occur directly above the duct banks. Rapid reductions in

HVAC EMF were measured in the model with increasing distance from the duct bank centerlines. All modeled HVAC EMFs remain below the International Commission on Non-Ionizing Radiation Protection health-based guideline of 2,000 mG for allowable public exposure to 60-hertz magnetic fields. For both duct bank layouts, HVAC EMF levels at lateral distances of ±10 ft (3 m) from the cables are below the Massachusetts guideline of 85 mG for EMFs at ROW edges. It is important to note that the Massachusetts guideline of 85 mG was developed for application to overhead transmission line ROW edges, as opposed to underground lines and roadways, which are generally farther away from the centerline of the overhead circuit centerlines to the edge of the road. Two scenarios each with varying circuits and duct bank configurations were modeled for the HVAC onshore export cables and the underground transmission route. The HVAC onshore export cable models assumed a cable voltage of 275 kV and the underground transmission route models assumed a cable voltage of 345 kV. A summary of the modeled EMF results for all modeled cases are listed in **Table 3-44**. Additional details regarding onshore EMF modeling can be found in Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project.

TABLE 3-44. EXPORT CABLE AND UNDERGROUND TRANSMISSION ROUTE EMF MODELING RESULTS

Case	Maximum EMF (mG) above Duct Bank Centerline	EMF (mG), ± 10 ft (3 m) from Duct Bank Centerline	EMF (mG), ± 25 ft (7.6 m) from Duct Bank Centerline
275 kV, 1	291	178 / 175	43 / 43
275 kV, 2	216	90 / 90	10 / 10
345 kV, 3	308	180 / 180	47 / 47
345 kV, 4	390	143 / 146	34 / 34

Source: Appendix P1, Electric and Magnetic Field (EMF) Assessment for the Proposed Mayflower Wind Project

An HVDC EMF assessment is provided in Appendix P2, however no modeling has been conducted at this time. In summary, evidence of behavioral responses from marine species to EMFs from HVDC cables is inconsistent, and there is no conclusive evidence indicating that behavioral responses have potential population-level detrimental impacts.

3.4.5 Planned Discharges

Planned discharges from vessel and construction site operations, while anticipated to be infrequent, may occur over the lifespan of the proposed Project, with the bulk of potential discharges during the construction and operational phases. Specific activities related to planned discharges are listed in **Table 3-45**. Additional details on types of wastes generated, waste management approaches, and planned discharges are described in Section 3.3.16. Planned discharges will also cover air emissions and are discussed in Section 3.4.5.3. The probability of effects from planned discharges are very low given waste management protocols developed to meet regulatory requirements.

TABLE 3-45. PLANNED DISCHARGES–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Planned discharges	Construction	Vessel operations
		Construction equipment and activities
		Stormwater runoff

IPF	Project Phase	Project Activities Causing IPF
	O&M	Stormwater runoff
		Vessel operations
		Seawater cooling water treatment
	Decommissioning	Vessel operations

In the case of the DC converter platforms, de-ionized water is used to cool the electrical equipment. This water is cooled with seawater pumped up for this specific purpose. The water is pumped up, used for cooling and discharged to sea again. Sodium Hypochlorite is injected at the intake of the seawater to inhibit marine growth in the cooling equipment with an expected concentration of 10–200 parts per million.

3.4.5.1 Construction and Decommissioning

3.4.5.1.1 Vessel Operations

Routine releases from vessels involved in constructing and decommissioning will comply with appropriate Project-specific guidelines put in place to minimize effects. These releases may include bilge water, engine cooling water, deck drainage, and ballast water. Nearshore discharges and discharges in port are regulated and No Discharge Zones regulated by the Massachusetts Office of Coastal Zone Management and CRMC are in effect in all state coastal waters.

3.4.5.1.2 Construction Activities, including Stormwater Runoff

Stormwater runoff is rainfall that flows over the ground surface, in this case, over a construction area. A National Pollutant Discharge Elimination System permit for stormwater discharges associated with construction activities for inland construction, as required by the Clean Water Act, will be obtained for construction activities. Best management practices will be in place to safely manage stormwater runoff.

3.4.5.2 Operations and Maintenance

3.4.5.2.1 Stormwater Runoff

While observed at a lesser magnitude than during the construction phase, stormwater runoff can still be present during the operational phase of the proposed Project at onshore and offshore Project locations. The proposed Project will be developed to meet all applicable regulations and local ordinances.

3.4.5.2.2 Vessel Operations

Vessels used for scheduled or unscheduled maintenance activities during the operational phase may routinely generate waste, although occurrences will be sporadic and of short duration relative to the construction phase. Following the same practices as the construction and decommissioning phases, vessel operations during the operational phase will follow appropriate Project specific guidance and regulations from the Massachusetts Office of Coastal Zone Management and the CRMC.

3.4.5.2.3 HVDC Converter Station Operations

Each HVDC converter station will include a CWIS that will utilize a vertical intake attached to the OSP foundation structure with an intake velocity of 0.5 ft/s (or less) to supply up to 10 MGD of once-through, non-contact cooling water to the OSP, which will then be discharged to a vertical pipe attached to the OSP foundation structure. Plankton in the water column will likely be subject to entrainment through the intake. Pelagic marine organisms will likely be exposed to the thermal discharge associated with the CWIS. A full discussion of impacts associated with these activities are accounted for in individual COP Sections 3 through 6 where applicable for each resource that may be impacted by the CWIS.

3.4.5.3 Planned Discharges: Air Emissions

Air emissions as a result of proposed Project activities are anticipated to occur in all phases, including pre-construction survey work. SouthCoast Wind will apply for a separate air permit for decommissioning; thus, the decommissioning phase is not included in this discussion. An air emissions study, located in Appendix G, Air Emissions Report, was conducted to model the worst-case scenario air emissions for construction and O&M phases of the proposed Project. Air emissions are associated with the activities listed in **Table 3-46**.

TABLE 3-46. AIR EMISSIONS–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Planned Discharges: Air emissions	Construction	Vessel operations
		Construction equipment and activities (offshore and onshore)
		Vehicles
		Generators
		Helicopters/drones
	O&M	Vessel operations
		Generators
		Helicopters/drones

Total modeled emissions during construction are detailed in Appendix G, Air Emissions Report, and Section 5.1. As the proposed Project will not inherently add to pollution during operation, the use of power generated will avoid emissions in New England of CO_2, NO_X, and SO_2 associated with conventional power generation. Avoided emission factors are listed in **Table 3-47.** Detailed methodology regarding calculation methods and scenarios for air emissions modeled for the proposed Project, emissions sources, avoided emissions, and regulatory requirements for the EPA and Massachusetts are also listed in Appendix G, Air Emissions Report. Once emissions are inventoried for the Brayton Point components of the Project, Appendix G, Air Emissions Report, will be updated to account for these activities. Regulatory requirements for Rhode Island, in addition to EPA and Massachusetts, will be addressed.

TABLE 3-47. AVOIDED EMISSION FACTORS

Pollutant	CO_2	NO_X	SO_2
Annual Avoided Emissions in New England (tons/year)	4,038,482	692	313
Avoided Emissions over Project Lifespan in New England (tons)	133,269,904	22,825	10,324

3.4.6 Accidental Events

Accidental events that could occur include unplanned discharges and releases, allision and collision, and other health and safety events. SouthCoast Wind will implement Health, Safety and Environment (HSE) programs during all phases of the Project to minimize the potential occurrence and effects of accidental events. The types of Project activities with potential for these types of events are listed in **Table 3-48**. Given the Project safety systems and waste management systems described below, the probability of an accidental event is low.

TABLE 3-48. POTENTIAL TYPES OF ACCIDENTAL EVENTS–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Accidental events	Construction	Vessel operations
		Onshore and offshore construction
	O&M	WTG and OSP operations
		Onshore substation/converter station operations
		Vessel operations
	Decommissioning	Vessel operations

Marine navigation accidental events are evaluated in the Navigation Safety Risk Assessment (NSRA) (Appendix X) and in Section 13, Transportation and Navigation. Accidental events could also include discharge of debris to the marine environment.

The SouthCoast Wind SMS, included in Appendix Z, will serve as the cornerstone of the HSE program. The SMS is a high-level document that outlines SouthCoast Wind's health and safety policy and procedures at the corporate level and will provide guidance in the occurrence of an accidental event. The objective of the SMS is to describe the processes and procedures that when successfully implemented, ensure the safety of anyone on or near the Project facilities. The safety management foundation of planning, doing, checking, acting, and striving for continuous improvement is necessary to ensure safety.

SouthCoast Wind will establish ERPs, which are essential for responding effectively to incidents and that mitigate the consequences resulting from such incident. The ERPs will include preparedness, training, drills, and exercises that test the effectiveness of the response organization.

3.4.6.1 Construction and Decommissioning

3.4.6.1.1 Vessel Operations

Accidental discharges of vessel fuels and oil could occur during construction and decommissioning. BMPs involving refueling and equipment servicing will be in place. As accidental events may still occur, SouthCoast Wind has included measures for cleanup of accidental releases in the OSRP (Appendix AA). Vessel-based operations will increase during the construction and decommissioning phases of the Project, with the majority of activity within the Lease Area.

The NSRA for the proposed Project details accidental events involving vessels during the construction and decommissioning phases of the proposed Project and their likelihood of occurring. These accidental events involving vessels are discussed in Section 13, Navigation and Vessel Traffic.

In addition to accidental releases, accidental events requiring an emergency response plan or safety management system may occur during construction and decommissioning. SouthCoast Wind has provided an emergency response plan and a detailed safety management system highlighted in Section 15, Public Health and Safety, Appendix Z, SMS, and Appendix AA, OSRP.

3.4.6.1.2 Construction Equipment

Accidental events occurring during construction, including accidental releases of wastes, trash, or debris and accidental events involving machinery, vehicles, or personnel, are also accounted for an in Appendix AA, OSRP, and Appendix Z, SMS.

3.4.6.2 Operations and Maintenance

3.4.6.2.1 WTG and OSP Operation

Accidental events involving WTG and OSP operation could include accidental discharges and other HSE accidents. The types of chemical products used for the proposed Project, which could be accidentally released, are discussed in Section 3.3.17 Chemical Use and Management. This list primarily includes diesel and various types of oils (insulating, lube and hydraulic). BMPs are in place to keep personnel safe but accidental events and safety procedures following these events are detailed in Appendix AA, OSRP.

3.4.6.2.2 Onshore Substation and HVDC Converter Station Operation

Operation of the onshore substation and converter stations may also experience accidental events. SouthCoast Wind has detailed plans for accidental events in Appendix AA, OSRP.

3.4.6.2.3 Vessel Operations

Since Project-related vessel operations will be greatly reduced during the operational phase compared to construction/decommissioning, the likelihood of accidental events involving vessels is also reduced. The types of accidents are similar, including the potential for accidental discharge of fuel and oil during operation and maintenance activities. BMPs involving refueling and equipment servicing will be in place. SouthCoast Wind has included detailed measures for cleanup of accidental releases in Appendix AA, OSRP.

The NSRA details accidental events during the operational phase of the Project and their likelihood of occurring. These accidental events involving vessels are discussed in Section 13.0 and Appendix X, NSRA.

In addition to accidental releases, accidental events requiring an emergency response plan or safety management system may occur during operation. SouthCoast Wind has a safety management system, inclusive of an emergency response plan, in Appendix Z, SMS.

3.4.7 Altered Visual Conditions

Aspects of the proposed Project that will result in varying levels of alterations to visual conditions are listed in **Table 3-49**. Additional information on visual resources can be found in Section 8.0, Visual Resources, and Appendix T, Visual Impact Assessment. Changes to visual conditions will occur onshore and offshore during construction, operation, and decommissioning as Project components, will be visible at different phases of the proposed Project. Visual simulations under a range of meteorological conditions for both onshore and offshore Project components are included in Appendix T, Visual Impact Assessment.

TABLE 3-49. ALTERED VISUAL CONDITIONS–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Altered visual conditions	Construction	Offshore/onshore construction equipment
	O&M	Presence of offshore structures (WTGs and OSPs)
		Presence of onshore structures (onshore substation and HVDC converter station)
	Decommissioning	Offshore/onshore decommissioning equipment

3.4.8 Natural Hazards

Natural hazards are not caused by Project activities like other IPFs. Extreme weather events including hurricanes and nor'easters, seismic events, and climate change may affect construction, O&M, and decommissioning activities. Shallow hazards are discussed in Section 4, Site Geology and Environmental Conditions. Information on the history of storms in the Project Area is also included in Section 4, Site Geology and Environmental Conditions. Climate change could result in changes in storm and weather patterns but is not anticipated to negatively impact the Project infrastructure or activities.

The Lease Area is located in an area with low historical seismicity and mapped faults in the area are considered to be inactive. Fault rupture hazard is not anticipated to be a hazard and seismic hazards (e.g., liquefaction, strong ground shaking, lateral spreading, etc.) are not deemed to present a hazard to cables in the export cable corridor.

Table 3-50 lists the types of natural hazards that could affect the proposed Project.

TABLE 3-50. NATURAL HAZARDS–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Natural Hazards	N/A	N/A-not associated with specific Project activities: extreme weather events (hurricanes, nor’easters), seismic events, and climate change may affect construction, O&M, and decommissioning activities

3.4.9 Activities that may Displace or Impact Fishing, Recreation, and Tourism

The proposed Project will see interactions with recreational and commercial fishing, recreational activities, and local tourism in the vicinity of the proposed Offshore Project Area. Specific activities that may displace or impact fishing, recreation and tourism are listed in **Table 3-51**. Additional details are provided in the following:

- Section 10, Socioeconomics
- Section 11, Commercial and Recreational Fishing
- Appendix V, Commercial and Recreational Fisheries and Fishing Activity Technical Report
- Section 14, Other Marine Uses

TABLE 3-51. ACTIVITIES THAT MAY DISPLACE OR IMPACT FISHING, RECREATION AND TOURISM–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Activities that may displace or impact fishing, recreation, and tourism	Construction	Vessel activity and construction operations
		Gear interactions
		Workforce hiring
		Procurement of materials and equipment
		Procurement of services including port use and vessel charter
	O&M	Presence of infrastructure
	Decommissioning	Vessel activity and decommissioning operations
		Gear interactions
		Workforce hiring
		Procurement of materials and equipment
		Procurement of services including port use and vessel charter

3.4.10 Influx of Non-Local Employees that Could Impact Housing

Specific activities related to an influx of non-local employees that could impact housing are listed in **Table 3-52.** More detailed information regarding the proposed Project's effect on housing as a result of non-local employees can be found in Section 10, Socioeconomics.

TABLE 3-52. INFLUX OF NON-LOCAL EMPLOYEES THAT COULD IMPACT HOUSING–IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Influx of non-local employees that could impact housing	Construction	Housing and temporary accommodation
	Decommissioning	Housing and temporary accommodation

3.4.11 Activities that may Cause Conflict with Temporal and Seasonal Space Use by Other Authorized Users of the Coastal Zone or Outer Continental Shelf

Specific activities that may cause conflict with temporal and seasonal space use by other authorized users of the coastal zone or OCS are listed in **Table 3-53.** More information regarding activities that may cause conflict with temporal and seasonal space use by other authorized users of the coastal zone or OCS can be found in Section 14, Other Marine Uses and Section 13, Navigation and Vessel Traffic.

TABLE 3-53. ACTIVITIES THAT MAY CAUSE CONFLICT WITH TEMPORAL AND SEASONAL SPACE USE BY OTHER AUTHORIZED USERS OF THE COASTAL ZONE OR OCS– IPF SUMMARY

IPF	Project Phase	Project Activities Causing IPF
Activities that may cause conflict with temporal and seasonal space use by other authorized users of the	Construction	Vessel activity
		Traffic
	O&M	Presence of the infrastructure

IPF	Project Phase	Project Activities Causing IPF
coastal zone or OCS		Maintenance activities
		Vessel activity
	Decommissioning	Vessel activity
		Traffic
		Presence of the infrastructure