MAYFLOWER WIND

Massachusetts
Energy Facilities Siting Board
MA Section 69J Analysis

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VOLUME 1 – ANALYSIS
VOLUME 2 – ATTACHMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES*

LIST OF ATTACHMENTS*

Note: These supporting documents and figures are bound separately in **Volume 2.*

Abbreviation	Definition
ac	acre
AC	Alternating current
AIS	Air Insulated Switchgear
AOI	Area of Interest
APE	Area of Potential Effect
Ave.	Avenue
AWOIS	Automated Wreck and Obstruction Information System
BGEPA	Bald and Golden Eagle Protection Act
BOEM	Bureau of Ocean Energy Management
BOP	Balance of Plant
BSEE	Bureau of Safety and Environmental Enforcement
BUAR	Board of Underwater Archaeological Resources
BWSC	Bureau of Waste Site Cleanup
CAPEX	Development and Capital Expenditures
CCA	Community Choice Aggregator
CFCRI	Commercial Fisheries Center of Rhode Island
C.F.R.	Code of Federal Regulations
CLB	Cable Laying Barge
CLV	Cable Laying Vessel
Clean Energy Resource	Offshore wind renewable energy generation facility
CO_2	Carbon dioxide
COD	Commercial Operation Date
COP	Construction and Operations Plan
C.M.R.	Code of Massachusetts Regulations
CPT	Cone penetration testing
CTV	Crew Transfer Vessel
CVA	Certified Verification Agent
DC	Direct current
DGPS	Differential Global Positioning System
DOER	Massachusetts Department of Environmental Protection
DPU	Department of Public Utilities
Dr.	Drive
DTF	Data Transfer File
EC	Export Cable
ECC	Export Cable Corridor
EDC	Electric distribution companies
EDPR	EDPR Offshore North America LLC
EEA	Executive Office of Environmental Affairs
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ENC	Electronic Navigation Chart

Abbreviation	Definition
ENF	Environmental Notification Form
EMF	Electric and magnetic field(s)
EoS	Economies of Scale
EPC	Engineering, Procurement, Construction
EPCI	Engineering, Procurement, Construction, Installation
ESA	Endangered Species Act
ETU	Elective transmission upgrade
Eversource	NSTAR Electric Company d/b/a Eversource Energy
FDR	Facility Design Report
FEED	Front-End Engineering and Design
FEMA	Federal Environmental Management Agency
FID	Final Investment Decision
FIR	Fabrication and Installation Report
FR	Fisheries Representatives
FS	Feasibility Study
ft	feet
GHG	Greenhouse Gas
GIS	Gas Insulated Switchgear
G.L.	General Law
GWSA	Global Warming Solutions Act
ha	Hectare
HDD	Horizontal Directional Drilling
HRG	High-resolution geophysical
HVAC	High-volage alternating current
HVDC	High-volage direct current
IAC	Inter-array cable
IHA	Incidental Harassment Authorization
In	Inch
IPF	Impact-Producing Factor
ISO	Independent System Operator
ISO-NE	ISO Inc. New England
km	kilometer
kV	kilovolt
ITC	Investment Tax Credit
JU Barge	Jack-Up Barge
KP	kilometer points
LAT	Lowest Astronomical Tide
LCoE	Levelized Cost of Energy
Lease Area	BOEM Renewable Energy Lease Area OCS-A 0521
LGIA	Large Generator Interconnection Agreement
LHD	Local Historic District

Abbreviation	Definition
LiDAR	Light imaging, Detection, and Ranging
Ln.	Lane
m	meter
MA	Massachusetts
MA BUAR	Massachusetts Board of Underwater Archaeological Resources
MA DMF	Massachusetts Division of Marine Fisheries
MA ESFB	Energy Facilities Siting Board
MAG	Magnetometer
MA/RI WEA	Massachusetts/Rhode Island Wind Energy Area
MassCEC	Massachusetts Clean Energy Center
MassDEP	Massachusetts Department of Environmental Protection
MassGIS	Geographic Information System
Mayflower Wind	Mayflower Wind Energy LLC
MBES	Multibeam Echo Sounder
MBTA	Migratory Bird Treaty Act
MCP	Massachusetts Contingency Plan
ME	Market Efficiencies
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
MHC	Massachusetts Historical Commission
mi	Mile
MLA	Massachusetts Lobstermen's Association
MLLW	Mean Lower Low Water
mm	Millimeters
MMPA	Marine Mammal Protection Act
MOD	Money of Day
MP	Monopile
MW	Megawatt
NAD	North American Datum
National Grid	New England Power Company d/b/a National Grid
NBPA	New Bedford Port Authority
NE WEA	New England Wind Energy Areas
NEPA	National Environmental Policy Act
NHESP	Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NOI	Notice of Intent
NOx	Nitrogen Oxide
O&M	Operations & Maintenance

Abbreviation	Definition
OCS	Outer Continental Shelf
OEC	Offshore Export Cable
OMP	Ocean Management Plan
OPEX	Operational Expenditures
OSP	Offshore Substation Platform
OSPR	Oil Spill Response Plan
OW	Ocean Winds North America LLC
PDE	Project Design Envelope
POI	Point of Interconnection
PPA	Power Purchase Agreements
QP	queue positions
RFI	Request for Information
RFP	Request for Proposals
RI	Rhode Island
RIDEM	Rhode Island Department of Environmental Management
RI EFSB	Rhode Island Energy Facilities Siting Board
ROD	Record of Decision
RODA	Responsible Offshore Development Alliance
ROV	Remote Operated Vehicle
ROW	Right-of-Way
Rte.	Route
RWU	Roger Williams University
SAP	Site Assessment Plan
SAV	Submerged aquatic vegetation
SCADA	Supervisory Control and Data Acquisition
Shell NE	Shell New Energies US LLC
SIS	System Interconnection Study
Siting Board	Energy Facilities Siting Board
SSU	Special, Sensitive and Unique
SMA	Service & Maintenance Agreement
SO_2	Sulfur dioxide
SOV	Service Operations Vessel
St.	Street
TJB	transition joint bay
TLP	tension leg platform
TMP	Traffic management plans
TP	Transition Piece
TSA	Turbine Supply Agreement
TSO	Transmission Service Operator
TSS	Total Suspended Solids
Unitil	Fitchburg Gas and Electric Light Company d/b/a Unitil

Abbreviation	Definition
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
UXO	Unexploded ordnance
WBS	Work Breakdown Structure
WDT	Weather Down Time
WTG	Wind Turbine Generator
XLPE	Cross-linked polyethylene

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1 PROJECT OVERVIEW

Mayflower Wind Energy LLC (Mayflower Wind) is in the process of permitting the development of an offshore wind renewable energy generation facility (Clean Energy Resource) capable of generating an estimated 2,400 megawatts (MW) of renewable clean energy from federal waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0521 (Lease Area). The Lease Area at its closest edge, is approximately 39 nm (72 km) south from the mainland at Nobska Point in Falmouth, Massachusetts. Mayflower Wind's Clean Energy Resource encompasses all wind turbine generators (WTGs), offshore substation platforms (OSPs), and inter-array cables in federal waters. The Clean Energy Resource, together with its transmission connector projects, including the connector facilities that are the subject of this analysis in support of Mayflower Wind's siting petition (Analysis), will substantially contribute to meeting the regional need for reduced greenhouse gas (GHG) emissions and increased supply of renewable clean energy from offshore wind generation, thereby carrying out important public policy requirements of the Commonwealth of Massachusetts and the region.

For purposes of this Analysis the "Project" includes all Massachusetts-jurisdictional transmission connector elements, including the offshore export cables in Massachusetts state waters, the onshore facilities for the sea-to-shore transition and the onshore export cables. Also part of the Project are the onshore high-voltage direct current (HVDC) converter station and 345-kilovolt (kV) high-voltage alternating current (HVAC) underground transmission lines from the converter station to the point of interconnection (POI) at the existing National Grid substation at Brayton Point in the Town of Somerset, Massachusetts, and any other ancillary structures which are an integral part of the operation of these transmission connector facilities. Brayton Point is an ideal site for the interconnection of offshore wind such as the Clean Energy Resource for several reasons, including, among others: (i) the robust 345-kV regional transmission infrastructure available there, (ii) the brownfields legacy of the site, which both reduces impacts to the natural environment and provides an opportunity to revitalize it for clean energy uses and for the benefit of the community, (iii) its waterfront location, and (iv) its lack of residential abutters.

The Project also includes a design variation (Noticed Variation[1]) that would apply to the landfall and onshore export cable portions of both the proposed route (Preferred Route) and the alternative route (Noticed Alternative) at Brayton Point. The Noticed Variation would prudently and efficiently provide for potential future increased delivery of offshore wind energy by authorizing increased trenching and spare conduits at the site to support additional power flows above 1,200 MW if needed in the future.

The purpose of the Project is to deliver renewable clean energy from an estimated 1,200 MW of capacity from Mayflower Wind's Clean Energy Resource to Massachusetts and the New England regional electric grid. This Project and the associated Clean Energy Resource will significantly increase the renewable clean energy supply available to Massachusetts and regional consumers, substantially reduce

[1] The Noticed Variation would involve sizing underground infrastructure for the HVDC export cables to include spare conduits at landfall and onshore that would be capable of accommodating an additional 1,200-MW HVDC circuit. Mayflower Wind offers this option to minimize future impacts to the residents of the community and to the environment, and to provide flexibility, as we consider planning for the future expansion of the electric system in the Brayton Point area to accommodate the likely need to connect additional new renewable energy generation. This "Noticed Variation" would facilitate the delivery of an estimated 1,200 MW of renewable clean energy by "right-sizing" certain facilities (primarily trenching and conduit for onshore underground transmission cables) to minimize any likely siting, cost, community, and environmental impacts. Two additional (spare) HDD conduits would be constructed at landfall, which would require two additional HDD exit pits. Onshore, trenching activities for the concrete-encased conduit system (i.e., duct bank) would require excavating approximately 1.0 foot (0.3 m) deeper. At locations along the route where segments of cable must be joined together (i.e., spliced), an additional vault would be constructed. Developing the Project in this way would mean only one disturbance of the natural and developed environment, rather than a second time when a second 1,200 MW connector project might be needed in the future for the export cables. To the extent that Mayflower Wind seeks to use this additional infrastructure for additional export cables, Mayflower Wind would return to the EFSB for approval to do so.

GHG emissions across the region, supplement or displace electricity generated by fossil fuel-powered plants and improve energy system reliability and security. The Project will enhance economic competitiveness by reducing energy costs, attracting new investments, and creating job growth. Mayflower Wind is developing the Project in accordance with the need for clean energy and offshore wind established under the Commonwealth's and the region's public policies as reflected in legislation and executive orders. The Project is needed to enable delivery of energy from the Clean Energy Resource to Massachusetts and the New England region, and the Clean Energy Resource is likely to be available to contribute to the regional energy supply. The Project will serve the public interest by making a substantial contribution to meeting individual New England state GHG emissions reduction and renewable clean energy requirements, and is consistent with current health, environmental protection, and resource use and development policies of the Commonwealth.

The Clean Energy Resource will be subject to review under federal processes coordinated by BOEM, while the Project will be subject to Massachusetts regulatory agency reviews, including the review conducted by the Massachusetts Energy Facilities Siting Board (MA EFSB or "Siting Board") pursuant to Massachusetts General Laws (G.L.) c. 164 § 69J (Section 69J Petition).

The Clean Energy Resource, together with additional federal-jurisdictional facilities, the Project (Massachusetts-jurisdictional), and the Rhode Island-jurisdictional facilities are described in Section 1.3 and shown in the Project Overview Map (Figure 1-1 in Attachment A - Figures).

1.1 INTRODUCTION

1.1.1 Siting Board Jurisdiction

Pursuant to G.L. c. 164, §§ 69G and 69J, the MA EFSB has jurisdiction over the construction of "a new electric transmission line having a design rating of 69 kV or more and which is one mile (mi) (1.6 kilometer [km]) or more in length on a new transmission corridor" and "an ancillary structure which is an integral part of the operation of any transmission line that is a facility" (980 Code of Massachusetts Regulations 1.01). Accordingly, Mayflower Wind has submitted this petition pursuant to Section 69J ("Section 69J Petition") and this supporting Analysis to the MA EFSB for authority to construct, operate, and maintain new +/-320 kV (nominal voltage) transmission export cables from its Clean Energy Resource to a new onshore HVDC converter station as well as 345-kV HVAC transmission cables/lines from the new converter station to the POI at an existing National Grid substation ("POI") at Brayton Point (Figure 1-1). Concurrently with its Section 69J Petition, Mayflower Wind will file with the Department of Public Utilities (DPU or "Department"): (1) a request for approval of the Project pursuant to G.L. c. 164, § 72 ("Section 72 Petition"); and (2) a request for exemptions from the operation of the Zoning By-Law of the Town of Somerset for the Project pursuant to G.L. c. 40A, §3 ("Chapter 40 A, §3") ("Zoning Petition"). Section 72 requires a petitioner to seek approval from the DPU "for authority to construct and use or to continue to use as constructed or with altered construction a line for the transmission of electricity for distribution in some definite area." Under this statute, the DPU must determine that "such a line will or does serve the public convenience and is consistent with the public interest." Chapter 40A, § 3 authorizes the DPU to issue zoning exemptions for "[l]ands or structures" to be used by "public service corporations" if such zoning exemptions are required and "reasonably necessary for the convenience or welfare of the public."

Mayflower Wind is presenting a Preferred Route to encompass the offshore export cables located in state waters, the sea-to-shore transition to the landfall, the onshore export cables, the HVDC converter station (including the HVAC air insulated switchgear [AIS] side of the converter station) and 345 kV HVAC underground transmission lines from the converter station to the POI for connection to the existing National Grid substation at Brayton Point. The Preferred Route will approach the Brayton Point

peninsula on the west side via the Lee River. Mayflower Wind is presenting a Noticed Alternative Route, which would approach Brayton Point on the east side of the peninsula from the Taunton River. Each would connect via underground HVDC export cables to the HVDC converter station, and then connect to the POI via 345 kV HVAC underground transmission lines. The Preferred Route and the Noticed Alternative Route for the Project, the offshore Export Cable Corridor (ECC), and a portion of the Clean Energy Resource are shown in Figure 1-1. Figure 1-2 depicts the Preferred Route and Noticed Alternative Route onshore transmission facilities. Figure 1-3 depicts the geographic relationship between the Preferred and Noticed Alternative Routes. Potential offshore ECCs were identified and vetted through a process that included consultations with relevant regulatory agencies, bathymetric data, geophysical surveys, geotechnical surveys, benthic habitat mapping, and seagrass surveys. One ECC to Brayton Point has been carried forward from the Construction and Operations Plan (COP) submitted to BOEM. As noted above and described further herein, Mayflower Wind is also proposing a Noticed Variation, which will apply to the landfall and onshore export cable portions of both the Preferred Route and the Noticed Alternative Route.

1.2 NEED FOR THE PROJECT

As set forth in Section 2 of this Analysis, Mayflower Wind has demonstrated that the Project is needed to deliver energy from the Clean Energy Resource and that the Clean Energy Resource is likely to be available to contribute to the regional energy supply. Therefore, Mayflower Wind has met the standard for demonstration of need in accordance with G.L. 164 §§ 69H, 69J and Siting Board precedent.

In addition to the specific indicators of progress of developing the Clean Energy Resource and the Project, strong public policies and legislative mandates drive the need for the Project. These public policies include those related to climate change, reduction of GHG emissions, increase of renewable clean energy supply, and development of offshore wind as a critically important energy resource and industry for the Commonwealth and the region.

1.3 PROJECT DESCRIPTION

The following sections describe the proposed Mayflower Wind Project, with particular focus on the portions of the Project within state jurisdiction. A brief description of development activities in federal waters and in Rhode Island is provided for overall context in Section 1.3.1. More detailed discussions are provided in Section 1.3.2 for the entire onshore transmission system and the portion of the ECC in state waters (see Figures 1-1 and 1-2). While the remainder of this section describes in detail those elements of the Project that are within state jurisdiction, Mayflower Wind provides here a brief but holistic view of the Project together with the Clean Energy Resource and the Rhode Island elements of the connector facilities:

Clean Energy Resource (Federal-jurisdictional)

- Up to 149 WTG/OSP positions (up to 147 WTGs) conforming to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout across the entire Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA), as agreed upon by Mayflower Wind and the other MA/RI WEA leaseholders and as supported by the United States Coast Guard (USCG).
- Up to five OSPs to be connected to the WTGs via inter-array cables within the Lease Area.

Additional Federal-jurisdictional Facilities

- The cables will be installed in a bundled configuration, consisting of two power cables and associated communications cabling, where practicable.

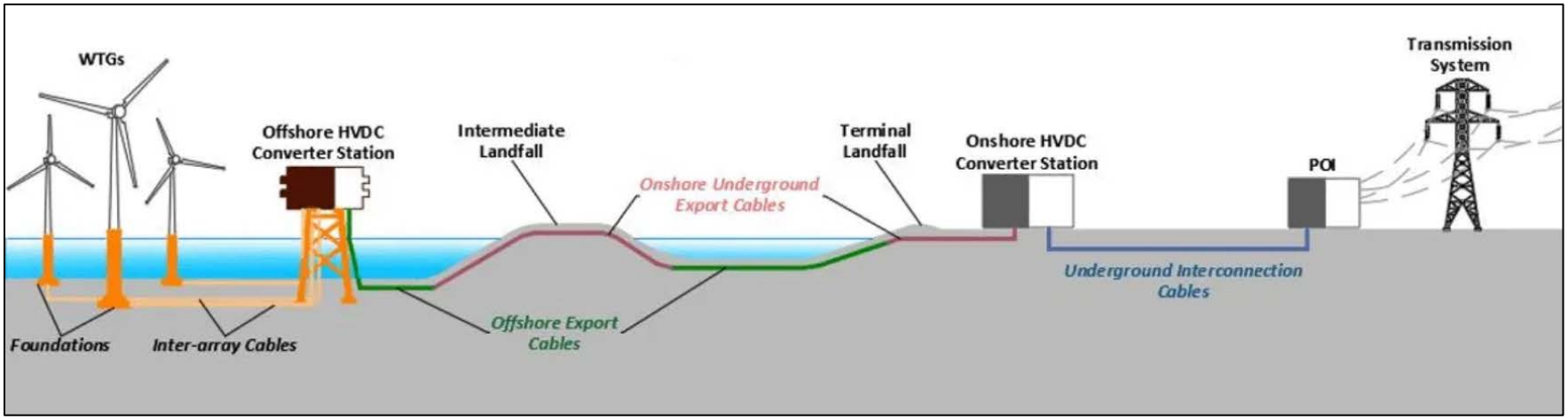
Massachusetts-jurisdictional Facilities

- The HVDC export cables will continue into Massachusetts state waters in Mount Hope Bay and make landfall at Brayton Point using horizontal directional drilling (HDD).
- After making landfall, two new underground HVDC onshore export power cables will transmit the Project's HVDC electric generation to a new, Mayflower Wind-developed onshore HVDC converter station. Associated communications cabling will be installed underground with the power cables.
- The onshore converter station is a specialized electrical substation designed to convert the HVDC power from the export cables to HVAC power to enable interconnection to the existing transmission infrastructure.
- Underground HVAC transmission lines will connect the converter station to the existing New England Power Company d/b/a "National Grid" 345 kV substation at the Brayton Point POI.

Rhode Island-Jurisdictional Facilities

- Two HVDC submarine power cables and associated communications cabling. The cables will be installed in a bundled configuration where practicable.
- The cables will be generally co-located within a single corridor through the Sakonnet River, make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, traverse Aquidneck Island for up to approximately 2.0 mi (3.2 km), and return to the water in Mount Hope Bay, with both landfall and exit from Aquidneck Island using HDD to minimize impacts.
- Two landfall work areas on Aquidneck Island for HDD construction activities:
    - One landfall work area on the northeast side of Aquidneck Island located at 0 Park Avenue (corner of Boyd's Lane and Park Avenue) or 0 Walnut Street (disturbed private property off of Park Avenue).
    - One landfall work area on the northwest side of Aquidneck Island (multiple locations are under consideration).
- Two new underground onshore HVDC export power cables and associated communications cabling co-located within a single corridor across Aquidneck Island.

The Project concept schematic below illustrates the offshore and onshore components of the Project in a cross-sectional view.



PROJECT CONCEPT SCHEMATIC

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1.3.1 Offshore Clean Energy Resource (Federal Waters, for background only)

The following provides a description of the offshore components of the Mayflower Wind Clean Energy Resource that fall within federal waters, and as such are not the subject of the Project's MA EFSB petitions. This description is intended to provide the reader with a broader context for the Project and for background information only.

The Mayflower Wind Lease Area is located south of Martha's Vineyard and Nantucket (Figure 1-1) within the MA/RI WEA (Figure 1-4). WTGs constructed within the Lease Area will deliver power via inter-array cables to one or more OSPs. The WTG/OSP positions have been established based on a 1.0 x 1.0 nm (1.9 x 1.9 km) grid oriented along the cardinal directions to maintain a uniform spacing of WTGs across all the lease areas within the MA/RI WEA. Two offshore HVDC export power cables and associated communications cabling will be installed from one or more OSP within the Lease Area in federal waters and will run through Rhode Island Sound to the Sakonnet River, making intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, then into Mount Hope Bay where the cables enter Massachusetts state waters (see Section 1.3.2).

Key characteristics of the Clean Energy Resource are summarized in Table 1-1.

TABLE 1-1. CLEAN ENERGY RESOURCE AND ADDITIONAL FEDERAL-JURISDICTIONAL FACILITIES (IN ACCORDANCE WITH THE COP)

Project Attribute	Description
Lease Area Size	127,388 ac (51,552 ha)
Lease Area Distance from Shore	~26 nm (49 km) south of Martha's Vineyard ~20 nm (37 km) south of Nantucket ~41 nm (76 km) from the mainland (Upper Cape Cod) ~51 nm (94 km) southeast of the Rhode Island coast
Clean Energy Resource Layout and Size	Up to 149 WTG/OSP positions Up to 147 WTGs Up to 5 OSP(s) 1 nm x 1 nm spacing Estimated 2,400 MW
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)
OSP(s)	Top of topside height above MLLW: 160.8 – 344.5 ft (49.0 – 105.0 m)
WTG/OSP Substructures	Monopile, piled jacket, suction-bucket jacket, and/or gravity-based structure Seabed penetration: 0 – 295.3 ft (0 – 90.0 m) Scour protection for up to all positions
Inter-Array Cables	Nominal inter-array cable voltage: 60 kV to 72.5 kV Length of inter-array cables beneath seafloor: 124.3 – 497.1 mi (200 – 800 km) Target depth of cover (below level seabed): 3.2 – 8.2 ft (1 – 2.5 m)
Offshore Export Cables[a]	Number of cables: Up to six (including up to four export power cables; and up to two dedicated communications cables) Nominal export cable voltage: +/-320 kV Total Length of Offshore Export Cable Corridor: 113 mi (182 km) Length of Offshore Export Cable Corridor in Federal Waters: 90.5 mi (145 km)

Project Attribute	Description
	Depth of cover (below level seabed): • Target: 6.0 ft (1.8 m) • Min – Max: 3.2 – 13.1 ft (1.0 – 4.0 m)
Offshore Structure Marking and Lighting	Consistent with applicable regulations and BOEM Guidelines (BOEM, 2021[b]) and with the latest Offshore Structure Private Aids to Navigation Permit Recommendations from the United States Coast Guard (USCG, 2020[c]).

Notes: Abbreviations are defined on the Abbreviation Table at the beginning of this document.
[a] The offshore export cable characteristics presented in this table represent the potential full development of the Clean Energy Resource (an estimated 2400 MW) for delivery to the Brayton Point area. This petition is not seeking approval of any federal jurisdictional facilities.
[b] https://www.boem.gov/sites/default/files/documents/renewable-energy/2021-Lighting-and-Marking-Guidelines.pdf
[c] USCG. (2020b). ME, NH, MA, RI, CT, NY, NJ-ATLANTIC OCEAN-OFFSHORE STRUCTURE PATON MARKING GUIDANCE-Revised*, First District Local Notice to Mariners, District: 1, Week: 44/20, 05 November 2020.*
https://www.navcen.uscg.gov/pdf/lnms/lnm01442020.pdf [navcen.uscg.gov].

1.3.2 Detailed Description (State Jurisdiction)

Portions of the Project within state geographic jurisdiction include all the transmission facilities and ancillary structures along the entire onshore transmission route, including the Mayflower Wind underground HVDC export cables, the HVDC converter station, the underground HVAC 345 kV transmission lines to the POI, and ancillary facilities, and the transmission facilities in the portion of the offshore ECC in state waters (Figure 1-5).

After crossing into state waters from Rhode Island to the south of Brayton Point in Mount Hope Bay, the ECC continues north through the bay to the landfall at Brayton Point. The sea-to-shore transition of the offshore export cables will be accomplished with HDD at the landfall location(s) at Brayton Point. Details regarding the offshore export cables and export cable landfall are provided in Sections 1.3.2.1 and 1.3.2.2, respectively.

The underground onshore export cables between the landfall location(s) and the HVDC converter station will be installed within existing developed and disturbed industrial area formerly used as the Brayton Point Power Station (Figure 1-2). The new HVDC converter station will convert the power from HVDC to HVAC at a nominal voltage of 345 kV to enable connection by the interconnecting transmission owner to its existing interconnection facilities and the POI located just south of the proposed converter station location at Brayton Point. The preferred landfall location is on the west side of Brayton Point via the Lee River. The underground 345 kV HVAC transmission lines will connect the HVDC converter station to the POI at the existing National Grid Brayton Point Substation. Table 1-2 provides a summary of pertinent Project details associated with the Project Area subject to state jurisdiction.

TABLE 1-2. KEY PROJECT DETAILS FOR AREAS SUBJECT TO STATE JURISDICTION

Project Attribute	Description
Offshore Export Cables (In State Waters)	Length of Offshore Export Cable Corridor in Massachusetts state waters: ~2.1 mi (3.4 km) Cable crossings: None anticipated in Massachusetts state waters. Cable Corridor Width: 1,640 ft (500 m) to 2,300 ft (700 m) Burial depth (below level seabed): • Target: 6.0 ft (1.8 m) • Min – Max: 3.2 – 13.1 ft (1.0 – 4.0 m)

Project Attribute	Description
Sea-to-Shore Transition	To be accomplished with HDD Approximate Length of HDD: 0.3 mi (0.5 km)
Landfall Location(s)	Somerset, MA (Brayton Point) Two landfall locations: western landfall site from the Lee River (Preferred), eastern landfall site from the Taunton River (Noticed Alternative)
Onshore Export Cables	Underground onshore export cable nominal voltage: +/-320-kV HVDC. Two onshore export power cables plus associated communications cabling Length (Preferred - western route): Approximately 0.6 mi (1.0 km) Depth of Cover (below ground surface to top of duct bank) • Target: 3.0 ft (0.9 m) • Min/Max: 2.0 – 15.0 ft (0.6 – 4.6 m)
Onshore HVDC Converter Station	HVDC converter station footprint: approximately 7.5 ac (3.0 ha), to convert from HVDC to HVAC HVDC converter station site: approximately 8.0 - 10 ac (3.2 ha-4.0 ha), large enough to accommodate storage, parking, access and egress and stormwater management elements
Onshore HVAC Underground Transmission Lines	Underground onshore transmission lines nominal voltage: +/-345 kV HVAC Length: Approximately: 0.2 mi (0.3 km) Depth of Cover (below ground surface to top of duct bank) • Target: 3.0 ft (0.9 m) • Min/Max: 2.0 – 15.0 ft (0.6 – 4.6 m)
Point of Interconnection	National Grid Brayton Point Substation (345 kV gas insulated switchgear [GIS] substation previously used for Brayton Point Power Station)

Notes: Abbreviations are defined on the Abbreviation Table at the beginning of this document.

1.3.2.1 Offshore Export Cables (within State Waters)

The offshore export cables will connect the OSPs located within the Lease Area to the landfall site(s). For transmission of the Clean Energy Resource's power to shore, Mayflower Wind plans to use HVDC facilities at a voltage of +/-320 kV (nominal voltage) as most suitable for the Project. 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. Preliminary design plans for the offshore export cable and sea-to-shore transition via HDD are provided in Attachment B – Preliminary Engineering Drawings.

Alternative routes for the ECC were evaluated and are discussed in Section 3 of this Analysis.

Offshore cable installation in state waters will be accomplished via vertical injector, jetting sled, jetting remote operated vehicle (ROV), pre-cut plow, mechanical plow, and/or mechanical cutting ROV system. Representative images of cable installation equipment are provided in Attachment C – Photo Array. From approximately 0.3 mi (0.5 km) offshore, the installation will be accomplished with HDD to avoid and mitigate for impacts to nearshore environmental resources such as coastal wetlands and shoreline as well as public access and use of coastal areas and beaches during installation.

Cable protection is typically required at any existing cable crossing location and for areas where targeted 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 seabed to allow the cable to further settle into the trench. 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.

1.3.2.2 Export Cable Landfall Locations

Many factors were evaluated when choosing or excluding a landfall location, and Mayflower Wind selected two alternatives for the Brayton Point landfall location as shown in Figure 1-1 and Figure 1-2. These landfall locations are:

- Western landfall, via the Lee River (Preferred Route)
- Eastern landfall, via the Taunton River (Noticed Alternative Route)

The western landfall via the Lee River is the preferred landfall location. The appeal of this location is the site's available land, previous use as a fossil fuel (coal/oil) fired power station, and overall suitability contrasts greatly from other alternatives that would require longer onshore cable routes, greater terrestrial impact, and/or use of a greenfield site. This area has only a slight elevation change, making it a prime candidate for HDD landfall and the siting of accompanying transition joint bays (TJBs).[2] Although the landfall is located within Federal Emergency Management Agency Zone VE and Zone AE, it is unlikely to be impacted by a typical storm event and, in any case, the underground transmission system will be designed to withstand submergence. Based on the analysis of the ECC options as described in Section 4, the western option was the selected route corridor for reaching the Brayton Point POI because it will mitigate for technical risks and cumulative impacts to sensitive and protected habitats. The western landfall route is the most advantageous route due to the fact that it provides the shortest cable length to the landfall thus minimizing electrical losses, it minimizes technical risks associated with steep seabed slopes, dredging operations, navigation and shipping channels, turning basins, and moored buoys, and it minimizes interaction with existing or planned infrastructure and other water-dependent uses including shipping and navigation channels and recreational areas.

1.3.2.3 Onshore Export Cables

The onshore activities associated with the Project will originate from the landfall of the offshore export cables emanating from Mount Hope Bay to the Lee River and onto Brayton Point. The onshore export cable system will be located underground between the landfall and the HVDC converter station for the Project. The onshore export cable system will consist of two new onshore export power cables, plus associated communications cabling containing fiber optics.

The onshore export cables will be installed within a common duct bank to be constructed within and beneath existing, previously developed/disturbed industrial areas associated with the former Brayton Point Power Station, and predominantly within existing access roads in the interior of the Brayton Point site. Preliminary engineering configurations of the duct bank are provided in Attachment B. The cable circuits will be installed using primarily an open-trench construction method typical of in-road utility line installation work.

1.3.2.4 HVDC Converter Station

As described above, Mayflower Wind will commission the development of a new onshore HVDC

[2] Each TJB is a concrete vault where each submarine cable will be spliced to an onshore cable. Each TJB can accommodate jointing for 1-2 power cables, which is driven by site-specific considerations with respect to how the vaults and cables can be configured spatially.

converter station which will connect to the existing National Grid substation to interconnect with the ISO New England Inc. (ISO-NE) administered regional transmission system.

The single proposed site for the HVDC converter station is located on Brayton Point (Figure 1-6). This site is approximately 8.0-10 acres (ac) (3.2 – 4.0 ha), large enough to accommodate storage, parking, access and egress and stormwater management elements. The site consists of previously developed and disturbed industrial land previously used for the Brayton Point Power Station. These new facilities will be enclosed within a security fence. The arrangement plan for the HVDC converter station layout is illustrated in Attachment B.

The converter station will be located on the north-central portion of the former Brayton Point Power Station site. The fossil fuel (coal/oil) fired power station was decommissioned in 2017. The maximum footprint of the converter station yard will be approximately 7.5 ac (3.0 ha). The onshore export cables will enter the converter station site from the west or from the southeast corner. New 345-kV underground transmission lines will exit the converter station site from the southeast corner. The construction of the HVDC converter station includes two phases: the civil construction and the electrical construction. The converter station 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 on a full-time basis.

Preliminary design plans for the proposed converter station are provided in Attachment B.

1.3.2.5 Onshore 345 kV Transmission Route

For the Preferred Route, 345-kV HVAC transmission from the HVDC converter station to the POI would consist of underground transmission lines approximately 0.2 mi (0.3 km) long located between the two facilities at the Brayton Point site. The interconnecting transmission owner, National Grid, would be responsible for any upgrades or modifications to the existing 345-kV substation at Brayton Point serving as the POI for the onshore transmission.

The preferred transmission route is illustrated in Figure 1-2.

1.3.2.6 Point of Interconnection

The POI is an existing 345-kV Gas Insulated Switchgear (GIS) substation facility previously used for the Brayton Point Power Station. Accessing a breaker at the existing substation will be via standard steel work outside National Grid's building to interconnect the underground transmission lines as well as connect communication/fiber cables and associated gear. Some improvements and expansion will be required at the National Grid facility to support delivery of approximately 1,200 MW of the Clean Energy Resource, including building and yard expansion, and reconductoring. Mayflower Wind is routinely consulting with National Grid.

1.4 ROUTING ANALYSIS

Mayflower Wind prepared a routing analysis which identified a Preferred Route and a Noticed Alternative Route. The proposed routes and their selection are described in Sections 3 and 4.

1.4.1 Project Alternatives

Before completing the routing analysis, Mayflower Wind undertook significant efforts to evaluate a wide range of alternatives to achieve the Project objectives. This includes the evaluation of alternate POIs, offshore export cable routes, landfalls, HVDC converter station locations, onshore export cable routes, transmission technology and construction methods. Mayflower Wind eliminated alternatives based on selection criteria including construction constraints, existing utility infrastructure conflicts, length of

route, traffic congestion, land use and environmental and social impacts.

The following steps were taken during the route selection and design process:

- Identify potential suitable POIs with electric grid capacity.
- Identify potential land parcels capable of HVDC converter station development.
- Identify potential landfall locations capable of providing suitable area for HDD and TJB installation.
- Identify a geographic Study Area that incorporates the POI, proposed HVDC converter station location and proposed landfall location.
- Assess potential routing options within the geographic area that would connect landfall, HVDC converter station, and POI.
- Evaluate each routing option for fatal flaws and only move forward with feasible options.
- Evaluate potential environmental impact, engineering feasibility, constructability, permitting, reliability, and cost criteria.
- Prudently and efficiently plan for future need for increased energy deliveries to the Brayton Point area.

1.4.2 Existing Infrastructure

1.4.2.1 Onshore Infrastructure

Brayton Point is the site of a recently decommissioned fossil fuel (coal/oil) fired 1,600-MW base load power station located on a brownfields site of approximately 300-ac (121-ha) in the Town of Somerset on Mount Hope Bay, the Lee River, and the Taunton River. The substation which served Brayton Point is owned and operated by New England Power d/b/a National Grid. The substation is connected to the bulk power grid by two 345-kV overhead transmission lines which run north to Medway as well as several 115-kV overhead transmission lines running north, east, south, and west. Brayton Point's existing attributes, including the robust grid infrastructure present there, its status as a brownfields site capable of development for clean energy purposes, and its waterfront location make it an ideal interconnection location for offshore wind.

As noted in Section 1.3.2.5, Mayflower Wind will require an interconnection to be provided by the interconnecting transmission owner at the Brayton Point substation POI. Routing for Mayflower Wind's underground export and transmission cables considered other built utility infrastructure located in or crossed by the proposed cable routes.

Another guiding principle used while conducting the routing analysis was to avoid conflicts with existing utility infrastructure that would make installation of the Project transmission facilities technically infeasible.

1.4.2.2 Marine Infrastructure

Narraganset Bay, the Sakonnet River, and Mount Hope Bay contain existing marine infrastructure that was considered during the offshore routing analysis. These features include navigation channels, anchorage areas, ordnance disposal sites, and existing or planned marine cables, and are depicted on nautical charts jointly issued by the United States Department of Commerce.

The selection of landfall locations as well as the final ECC considered the location of existing marine infrastructure and sought to minimize risks to existing built infrastructure. The selected ECC and

Preferred landfall location (shown in Figure 1-1) avoid the need to cross charted power cables and other marine infrastructure.

1.4.3 Environmental and Socioeconomic Considerations

As detailed in Section 5, the presence of and potential impacts to various natural environmental resources and/or socioeconomic concerns were an important consideration in the evaluation and selection of final offshore and onshore routes and the location of Project elements.

1.4.3.1 Onshore Project Facilities

Figures 1-7 illustrate various environmental constraints for the Preferred and Noticed Alternative Routes. The features illustrated here represent a subset of environmental and socioeconomic considerations factored into the route scoring and analysis leading to the selection of the Preferred Route. The Preferred Route and the HVDC converter station site have been selected to avoid or minimize impacts to the natural or human environment to the extent practicable.

1.4.3.2 Offshore ECC

Figure 1-8 and Figure 1-9 illustrate the location of the ECC relative to regulated resources (i.e., Massachusetts Ocean Management Plan, Special, Sensitive and Unique [SSU] resources and shellfish suitability areas within the Massachusetts coastal zone boundary).

1.4.4 Summary of Routing

1.4.4.1 Preferred Route

The Preferred Route enters Massachusetts state waters southwest of Brayton Point in Mount Hope Bay. From here the Preferred Route travels northeast for approximately 2.1 mi (3.4 km), entering the mouth of the Lee River on the west side of Brayton Point. At the termination of the offshore export cable west of Brayton Point, the sea-to-shore transition for the Preferred Route will utilize HDD to connect into onshore export cables southwest of the proposed onshore HVDC converter station. The HDD will advance the proposed conduits and cables beneath the seabed and other marine and coastal resources. The onshore export cables will run from the HDD for approximately 0.6 mi (1.0 km) connecting to the northern side of the onshore HVDC converter station. From the converter station, underground 345-kV HVAC transmission lines will carry the converted power approximately 0.2 mi (0.3 km) south into the POI at the existing Brayton Point substation.

1.4.4.2 Noticed Alternative Route

The Noticed Alternative Route also begins where the offshore export cables enter Massachusetts state waters in Mount Hope Bay southwest of Brayton Point. From here, the Noticed Alternative Route travels northeast entering the mouth of the Taunton River on the east side of Brayton Point. At the termination of the offshore export cables east of Brayton Point, the sea-to-shore transition for the Noticed Alternative will utilize HDD to connect into onshore export cables southeast of the proposed onshore HVDC converter station. The onshore export cables will continue from the HDD for approximately 0.4 mi (0.6 km) connecting to the onshore HVDC converter station. From the converter station, underground transmission lines will then carry the converted power to the POI at the existing Brayton Point substation, approximately 0.2 mi (0.3 km) south of the proposed converter station.

1.4.4.3 Offshore Routing

Mayflower Wind evaluated two alternative ECC options from the Clean Energy Resource area through

Massachusetts state waters (in addition to four alternative ECC options through Rhode Island state waters enroute to Massachusetts waters). The two ECC options are represented by the Preferred and Noticed Alternative Routes, where one option approaches Brayton Point from the west side of the peninsula using the mouth of the Lee River as a landfall approach, and the second option approaches Brayton Point from the east side of the peninsula using the mouth of the Taunton River as an approach to landfall.

The selection of the ECC requires careful planning and route optimization with considerations including offshore physical hazards, economic or recreational use areas, protected areas (e.g., benthic habitats, marine mammals and sea turtles, and Essential Fish Habitat), and interconnection points. Physical hazards may include shipwrecks and submerged archaeological resources, unexploded ordnance, existing and planned submarine cables and pipelines, and seafloor and subsurface obstructions. Economic or recreational uses may include commercial or recreational fishing, recreational boating and tourism, navigation, and anchoring. Protected areas may include areas protected for biological, cultural, or historical importance.

In 2020, 2021, and 2022, Mayflower Wind performed marine surveys to identify and refine feasible routes for proposed offshore export cables that would avoid or minimize impacts to offshore and nearshore resources and existing infrastructure.

The selected offshore ECC located within Massachusetts state waters provides a relatively direct route for connecting the Clean Energy Resource to the Brayton Point landfall in Somerset. The offshore ECC maintains sufficient water depths for installation, avoiding or minimizing passage through shoals and large seabed slopes. The routing of the offshore ECC avoids or minimizes impacts to SSU areas, including hard/complex bottom, identified in the Massachusetts Ocean Management Plan (OMP).

1.5 PROJECT BENEFITS

The purpose of the Project is to deliver approximately 1,200 MW of renewable clean energy from the Clean Energy Resource[3] to Massachusetts and the New England regional electric grid (see Section 1.2). In doing so, the Project and the Clean Energy Resource will serve the public interest by providing numerous benefits as detailed below, including: (1) environmental benefits that will come from delivering large amounts of renewable clean energy into the electricity supply mix, thereby greatly reducing GHG emissions and contributing to the mitigation of climate change; (2) reliability benefits in the form of enhanced energy supply and fuel diversity and better ability to serve load during winter peak demand periods; and (3) economic benefits in the form of investment of billions of dollars in the region, stimulation of the local economies, employment opportunities, and development of the nascent offshore wind industry that is a key initiative of the Commonwealth and its policies and legislative mandates.

1.5.1 Environmental Benefits

The Project will provide significant environmental benefits. The Project is both driven by, and directly advances, the Commonwealth's public policy requirements for reducing GHG emissions, increasing clean energy supply, and developing the offshore wind energy industry. The Project satisfies the legislative directives of "*An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy*" signed by Governor Baker on March 26, 2021 ("*2021 Climate Act*") by providing for the delivery of approximately 1,200 MW of offshore wind energy into the Commonwealth that can serve commitments under existing Mayflower Wind Section 83C Power Purchase Agreements and for future offshore wind energy

[3] Mayflower Wind intends to develop the Clean Energy Resource up to the maximum capacity of the Lease Area, which is an estimated 2,400 MW based on the growth trajectory of wind turbine technology.

procurements.

Mayflower Wind's Clean Energy Resource will be among the largest contributors towards the Commonwealth's net-zero emissions mandate. This 1,200 MW Project will eliminate over two million metric tons of GHG emissions annually, which is equivalent to reducing the GHG emissions of more than 5 million miles driven each year (average passenger vehicle).[4]

As described in Section 1.5.2, because of the decommissioning of nuclear power plants at Pilgrim and Vermont Yankee, Yankee Rowe (185 MW), Connecticut Yankee (582 MW), Millstone 1 (652 MW), and Maine Yankee (900 MW) retirements, New England has lost significant "zero carbon" base load plants. These generation system changes increase the complexity and difficulty of achieving the aggressive GHG emissions reduction targets defined in the *Global Warming Solutions Act of 2008* and in the *2021 Climate Act*. The Project will help meet those targets by enabling approximately 1,200 MW of zero-carbon electric power to be delivered to the ISO-NE regional transmission system.

TABLE 1-3. AVOIDED EMISSIONS FACTORS BASED ON 1,200 MW

Pollutant	Carbon Dioxide (CO_2)	Nitrogen Oxides (NO_x)	Sulfur Dioxide (SO_2)
Annual Avoided Emissions in New England (tons/year)	2,358,509	945	1,235
Avoided Emissions over Project Lifespan in New England (tons)	77,830,809	31,176	40,740

Notes: Abbreviations are defined on the Abbreviation Table at the beginning of this document.

1.5.2 Reliability Benefits

The Project and the Clean Energy Resource will provide several reliability benefits to Massachusetts and New England, including:

- Enhancing the energy supply mix available to serve southeastern Massachusetts and Rhode Island electrical load by delivering energy at the POI at Brayton Point.
- By having a POI at Brayton Point, enhancing the energy supply mix available to serve load in the Southeastern Massachusetts and Rhode Island Load Zone (SEMA-RI), which has been subject to system constraints and has experienced the retirement of large fossil fuel and nuclear generation facilities over the past ten years.
- In addition to recently retired generation, ISO-NE has identified several thousand megawatts of additional fossil-fuel generation that is at risk for retirement in New England due to the age of the facilities and/or the effects of regulatory restrictions and the influx of low-variable cost renewable energy generation. The Project and the Clean Energy Resource will help fill this gap and will be located relatively near load centers, such as Boston and Providence.
- Enhancing the energy diversity of the overall New England generation supply mix with renewable clean offshore wind generation that has a relatively high-capacity factor due to the superior wind resource that is available farther out to sea where the Clean Energy Resource will be located.
- Enhancing the fuel diversity of the ISO-NE system, especially during winter months, when offshore wind speeds are likely to be strong, providing a high-capacity factor during those cold periods when the natural gas system could be constrained and less reliable. Wind speeds in the North Atlantic tend to be at their strongest and most stable during the winter.

[4] Greenhouse Gas Equivalencies Calculator (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator) (as of October 26, 2021)

1.5.3 Economic Benefits

The Project and its associated Clean Energy Resource will generate numerous economic benefits in Massachusetts and across New England. Economic benefits will be realized throughout the pre-construction, construction, operations and maintenance, and decommissioning phases. These benefits include the following:

- Mayflower Wind has executed a lease option with the Massachusetts Clean Energy Center (MassCEC) for the use of the New Bedford Marine Commerce Terminal as a staging and deployment base during construction. Mayflower Wind has committed to locate its operations and maintenance port in Massachusetts with at least 75 percent of operations and maintenance jobs hired locally.
- As part of the Commonwealth's Section 83C II and III bids, Mayflower Wind has committed to invest over $115 million in initiatives that will help make the Commonwealth and the South Coast region a hub for offshore wind. This total investment is based on commitments made under the Massachusetts offshore wind procurement awards:
    - $42.4 million, offered under the Section 83C III solicitation, with a focus on education, training, and workforce development; supply chain development; diversity, equity, and inclusion; and low-income ratepayer support.
    - $77.5 million, offered under the Section 83C II solicitation, that set a framework towards ports and infrastructure improvements; workforce training and development; applied research and innovation; marine science; and low-income ratepayer support.
- As part of Mayflower Wind's award of 804 MW power purchase agreement through the Commonwealth's 83C II offshore wind energy procurement, Mayflower Wind has committed to spend $72.5 million over 25 years in programs administered by MassCEC that help make the Commonwealth a hub for offshore wind energy. The package includes $35 million towards ports and infrastructure, $10 million towards innovative technologies, $5 million towards workforce development, $5 million towards applied research, $10 million towards direct support for marine science, and $7.5 million towards operation and maintenance port upgrades. In addition, Mayflower Wind has committed $5 million to the Cape Light Compact Joint Powers Entity, the energy services organization operated by 21 towns on Cape Cod and Martha's Vineyard, towards strategic electrification to reduce electric bills for low-income customers.
- As part of Mayflower Wind's award of a 400 MW power purchase agreement through the Commonwealth's 83C III offshore wind energy procurement, Mayflower Wind has committed to spend up to $42.3 million through its economic development package. The total package will support the building of the offshore wind supply chain; provide for education and training of an offshore wind workforce; make significant investments in local ports, businesses, and infrastructure; as well as offer diversity, equity and inclusion measures that include the hiring of specialized firms and support for low-income electric consumers, among other measures. The package includes $27 million over 10 years to the SouthCoast Community Foundation, and other binding partnerships with Gadding-Hearn Shipyard, Bristol Community College's National Offshore Wind Institute, Massachusetts Maritime Academy, National Society of Black Engineers Boston Professionals, MassHire Greater New Bedford Workforce Board, Buzzards Bay Area Habitat for Humanity, RPS and the SouthCoast LGBTQ+ Network.
- As a result of the extension of federal Offshore Wind Energy Investment Tax Credits in January 2021, Mayflower Wind announced that the cost of power in the Section 83C II Power Purchase Agreements (approved by the Massachusetts Department of Public Utilities in November 2020)

will drop even further. This price reduction likely means that the customers of three Massachusetts electric utilities can expect to save over $25 million each year, resulting in a half a billion dollars in lower electric bills over the life of the 20-year contracts.

- Mayflower Wind is committed to encouraging the hiring of personnel from the Project region to fill the positions required for the various preparation and construction activities. Furthermore, Mayflower Wind is committed to working upstream to aid in the development of a trained workforce for future construction of the Project and the Clean Energy Resource. The training and use of local and regional resources would be prioritized so that the regional populations can benefit as much as possible from the direct and indirect economic benefits. Mayflower Wind has further committed to make at least 75 percent of operations and maintenance local.
- Mayflower Wind is based in Boston and Fall River, Massachusetts, and the Project and the related Clean Energy Resource have many full-time professionals working in Massachusetts and Rhode Island on all aspects of the Project including design, permitting, stakeholder outreach, and financing.
- Mayflower Wind's extensive offshore survey campaigns in 2019, 2020, 2021, and 2022 have drawn on support services from across the southeastern Massachusetts region, including services such as vessel maintenance and repair, fuel and provisioning, protected species observers, inspection and health, safety, and environment consulting, and pilotage.
- The Project development, together with the long-term operation of the Clean Energy Resource, is estimated to provide at least $2.4 billion in total economic benefit to the Commonwealth (Massachusetts Department of Energy Resources [DOER] 2020) (based on 804 MW).
- Mayflower Wind estimates the Project and related activities will create more than 27,000 full time-equivalent jobs over the life of the Clean Energy Resource.
- As part of its anticipated waterways license pursuant to G.L. c. 91, the Project will pay a Tidelands Occupation Fee to the Commonwealth. This fee will be calculated based on the area of jurisdictional seafloor occupied by the Project in state waters. It is anticipated that the precise amount of the fee will be determined at the completion of construction based on actual permanent occupation of Commonwealth tidelands. The fee for Mayflower is currently estimated to be approximately $175,000, subject to adjustment based on final as built impact calculations.
- In accordance with the Massachusetts OMP review process requirements, the Project will pay an Ocean Development Mitigation Fee. This fee is intended to compensate the Commonwealth for unavoidable impacts on public interests and rights in the Ocean Management Planning Area and to support planning, management, restoration, or enhancement of marine resources and uses. This fee is in addition to the tidelands occupation fee, and other direct and indirect contributions by Mayflower Wind, and will be finalized during *Massachusetts Environmental Policy Act* review.
- Offshore wind is a rapidly developing industry, where supply chain contractors are actively seeking opportunities to enter the United States market or expand existing United States operations into offshore wind services. While Mayflower Wind is committed to local sourcing as much as possible, the Project and the Clean Energy Resource are designed within the limits of the current domestic supply chain and the respective roles of market participants, including original equipment manufacturers and engineering, procurement, construction, and installation service firm. The near–term supply for many of the largest components—including export cables, substations, gearboxes, and generators− are largely served by European firms. The opportunity for suppliers to enter the United States offshore wind market is highest in

foundations/substructures, towers, blade materials, and power converters and transformers. Potential areas for local contractors could include surveys, port operations, vessel operators, safety and training, blade repair, foundation and cable inspection and repair, among others.

- Mayflower Wind has partnered with the Northeastern Regional Association of Coastal Ocean Observing Systems to share real-time weather and ocean data collected by the buoy for mariners and the scientific community to use. The Northeastern Regional Association of Coastal Ocean Observing Systems' mission is to produce, integrate, and communicate high quality information that helps ensure safety, economic and environmental resilience, and sustainable use of the coastal ocean. Mayflower Wind's floating buoy data has helped to support these efforts and help to inform other research efforts in the Atlantic region. Mayflower Wind has also partnered with other educational institutions (e.g., New England Aquarium to study highly migratory fish species within the Lease Area and fisheries research with Responsible Offshore Science Alliance and University of Massachusetts Dartmouth School for Marine Science and Technology).
- Mayflower Wind is committed to working with local education institutions and engaging local students about potential career pathways in the offshore wind industry. Mayflower Wind has also engaged with other higher education institutions, such as Bristol Community College, Cape Cod Community College, Massachusetts Bay Community College, Massachusetts Maritime Academy, University of Rhode Island, University of Massachusetts Amherst, University of Massachusetts Lowell, University of Massachusetts Boston, and University of Massachusetts Dartmouth. Mayflower Wind has also held presentations about the Project for high school students, such as Falmouth Academy, and has supported education and training initiatives at local vocational technical high schools, such as Diman Regional Vocational-Technical High School and Old Colony Regional Vocational-Technical High School.
- Considering these benefits, the Project serves a key role in advancing a growing and thriving, utility-scale domestic offshore wind industry. Mayflower Wind is committed to working with Massachusetts, Rhode Island, local, regional, and federal officials, the Town of Somerset, City of Fall River and City of New Bedford in Massachusetts, and the Town of Portsmouth in Rhode Island, local businesses, research and educational institutions, the fishing community, environmental advocacy organizations, and other stakeholders to maximize this unique and timely opportunity to establish the Commonwealth and southern New England as a key center for the offshore wind industry in the United States.

1.6 CONSTRUCTION OVERVIEW

Mayflower Wind has selected cable installation techniques to maximize efficiency while avoiding and minimizing potential impacts. Onshore cable installation is proposed via open-cut trenching to accommodate a buried concrete duct bank and associated splice vaults. The transition between onshore and offshore cables is proposed via HDD to avoid disturbance and any direct impacts to shorelines and coastal habitats. Mayflower Wind is considering the following methods to install and bury the offshore export cable: vertical injector, jetting sled, jetting ROV, pre-cut plow, mechanical plow, and mechanical cutting ROV system.

1.7 SCHEDULE AND PHASING

The Project will require both onshore and offshore construction activities. Offshore activities within state waters are limited to the installation of the offshore export cable including the sea-to-shore transition via HDD. Onshore construction activities will include installation of the onshore underground export cables to the HVDC converter station, construction of the converter station, and construction of

the underground transmission lines to the POI.

An indicative baseline construction schedule for the Project is provided on the next page. The construction schedule may be moved year to year and timelines may be longer or shorter depending on the selection of final technologies and installation methodologies, and receipt of all federal, state, and local permits.

Mayflower Wind will acquire all necessary permits and authorizations before construction begins, which is currently anticipated to occur in 2024. 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 through to commissioning and energization is expected to take up to three years. Mayflower Wind's lease term for the operational phase is 33 years.

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 OSPs and WTGs 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.

The export cables and/or inter-array cables will be pulled into the OSPs and tested prior to energization. The OSPs topside could be installed immediately after the OSPs foundation is 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 required 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 Table 1-4 in an indicative sequence that could change based on installation methods, vessel and/or vehicle availability, and weather.

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TABLE 1-4. INDICATIVE PROJECT SCHEDULE FOR BRAYTON POINT

Mayflower Wind Indicative Project Construction Schedule																				
Focus	2023				2024				2025				2026				2027			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Onshore Components																				
Onshore Export Cable- Construction, Installation & Testing (Aquidneck Island)																				
Onshore Export Cable- Construction, Installation & Testing (Brayton Point)																				
Onshore Substation- Construction & Commissioning																				
HDD Construction																				
HDD Construction (Aquidneck Island)																				
HDD Construction (Brayton Point)																				
Offshore Export Cable - Installation and Termination																				
Offshore Export Cables - Installation & Termination																				

POI at Brayton Point

**Note - the construction windows are depicted above; actual construction durations within these windows may (are likely to be) shorter.*

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1.8 AGENCY AND COMMUNITY OUTREACH

Mayflower Wind understands the importance of government agency and community stakeholder engagement and has implemented an "early and often" engagement approach. A list of agency meetings and consultations to date is presented in Attachment D. Prior to the lease auction in December 2018, Mayflower Wind began outreach efforts with key groups, including fishing organizations, local community leaders, and appropriate government regulatory agencies. Mayflower Wind initiated this early engagement to understand stakeholder and agency concerns, in particular the scientific, socio-economic, and environmental issues. Mayflower Wind is committed to continuing the outreach efforts to ensure that local communities welcome, understand, and benefit from the proposed Project.

Mayflower Wind has consulted with the fishing industry, Native American Tribes, landowners, environmental groups, higher-education institutions, municipal government officials, state legislators, chambers of commerce, trade associations, economic development groups, regional science organizations, and port managers. These engagements will, where appropriate, continue throughout the lifetime of the proposed Project.

In addition, Mayflower Wind will comply with all applicable Environmental Justice (EJ) requirements including the new EJ requirements under the *2021 Climate Act*, and as interpreted through state agency guidance.

Key elements of the Mayflower Winds outreach program, as well as its outreach efforts to date, are described below.

Municipal and Stakeholder Briefings: Mayflower Wind has met with municipal officials and other stakeholders, including the Town of Somerset, City of Fall River, and City of New Bedford in Massachusetts and the Town of Portsmouth in Rhode Island. Mayflower Wind has communicated early geophysical and geotechnical survey activity with all municipal harbormasters and conservation and permitting offices in Somerset. Mayflower Wind has held virtual Open Houses to provide the public with opportunities to interact with Project subject matter experts, ask questions and share concerns. Mayflower Wind is committed to continue to host information sessions for local stakeholders throughout all phases of the Project. Due to the COVID-19 pandemic, many of the SouthCoast community engagement activities were held remotely in 2021 and 2022. On January 27, 2022, Mayflower Wind held a virtual Open House on SouthCoast Economic Development Investments. On May 4, 2022, Mayflower Wind held another virtual Open House featuring an animated 3D virtual tour of the Project, including a walk through the proposed offshore to onshore connection. Recordings of these Open Houses are available on Mayflower Wind's website.

Door-to-Door Outreach and Mailings: As part of future Open House promotions in 2022, the Company distributed approximately 500 informational postcards to Somerset residents and other community stakeholders about the Project.

Website: A website was developed for this Project (see https://www.mayflowerwind.com). The website provides basic Project information, maps, frequently asked questions, regular updates, and contact resources. Stakeholders can sign up for updates as the Project progresses through the "Stay Updated" tab. The Company has created a dedicated SouthCoast-specific webpage (https://mayflowerwind.com/southcoast/) for Somerset and regional stakeholders to learn more about how the Project will impact and benefit the local community, as well as get in touch with the SouthCoast Community Liaison Officer. As part of our commitment to fostering a local workforce, local contractors and suppliers can send their information directly to the Company's Procurement team through the Contractors & Suppliers webpage (https://mayflowerwind.com/join-us/contractors-and-suppliers/). The website is now available in nine different languages to increase accessibility.

Project Hotline: The toll-free Hotline number for the Project is 1-508-589-3557. The Project Hotline number is listed in all Project outreach materials, including fact sheets, subsequent mailings, the website, and at all community events. Mayflower Wind is committed to responding promptly to all inquiries.

Project E-mail: An email address (info@mayflowerwind.com) is designated for a timely response to property owner and other stakeholder questions, comments, or concerns.

Construction Community Outreach Plan: Mayflower Wind will execute a comprehensive construction community outreach plan to keep property owners, businesses and municipal officials including fire, police and other emergency response personnel, apprised of construction schedules, vehicular access, detours, and other traffic management information, local parking availability, emergency vehicle access, construction crew movement and parking, laydown areas, staging, and equipment delivery, nighttime or weekend construction, and road repaving. Once construction begins, Mayflower Wind will have a construction schedule webpage to alert abutters, residents and other stakeholders of construction locations, dates, activities, and traffic control measures.

1.8.1 Agency Meetings and Consultations

Mayflower Wind has been actively consulting with federal, state, and local agencies, and affected municipalities and tribes regarding Project status, planned studies, issues of concern, the permitting process, and related matters beginning in 2018. A list of meetings conducted to date with agencies, municipalities, and tribes is provided in Attachment D. Mayflower Wind plans to maintain an active level of consultation and outreach as the design effort continues and the Project proceeds through the permitting and development phase.

1.8.2 Stakeholder Engagement

In addition to consultations described in Attachment D, extensive and ongoing consultation has been conducted by Mayflower Wind with key stakeholders. Mayflower Wind has consulted with the fishing industry, Native American Tribes, landowners, environmental groups, higher-education institutions, municipal government officials, state legislators, chambers of commerce, trade associations, economic development groups, regional science organizations, and port managers. These engagements will, where appropriate, continue throughout the lifetime of the proposed Project. Mayflower Wind has engaged with, but not limited to, the above mentioned entities while a list of government agency engagement can be found in Attachment D.

1.8.3 Abutter Notification and Outreach

Although the Project has no direct abutters for the Preferred or Noticed Alternative Routes at Brayton Point, Mayflower Wind has been proactive in communicating about the Project with the neighboring communities. Mayflower Wind has hosted community virtual meetings and open house events in the SouthCoast community. On January 27, 2022, Mayflower Wind held a virtual Open House on SouthCoast Economic Development Investments. On May 4, 2022, Mayflower Wind held another virtual Open House featuring an animated 3D virtual tour of the Project, including a walk through the proposed offshore to onshore connection. Following submittal of the Project MA EFSB Petition, MA EFSB staff will finalize an abutter notification letter. The letter will include a description of the Project including the Preferred and Noticed Alternative routes (with a supporting map). The letter will also include a description of the MA EFSB review process and will welcome interested citizens to attend an MA EFSB-convened public comment hearing(s) in the Project region. The public comment hearing(s) will be conducted by an MA EFSB Hearing Officer. At the public comment hearing, Mayflower Wind will present an overview of the proposed Project. Public officials and members of the public will then have an opportunity to ask questions and make comments about the proposed Project.

In addition, Mayflower Wind will continue to regularly host public informational events and will widely advertise those events utilizing numerous outlets, including email, web, digital media, and posting in municipal and community bulletins. Mayflower Wind representatives plan to continue its efforts reach out to community and civic groups and to host office hours, info sessions and community forums, in a safe manner consistent with the Commonwealth's COVID-19 guidelines, as appropriate. Mayflower Wind has held two in-person office hour events in Fall River, the first in November 2021 focused on supply chain development and the second in December 2021 focused on workforce training and education opportunities. Mayflower Wind representatives also attend community events to spread information about the Project when possible, such as the SouthCoast Open Air Market at the Arthur Chick Marchand Park in Somerset in May 2022. Public events provide an opportunity for interested residents and officials to learn about Project details, connect with Project representatives, to have their questions answered and provide feedback.

1.9 CONCLUSION

By interconnecting an estimated 1,200 MW of renewable clean energy, the Project at Brayton Point advances the Commonwealth's and the region's strong public policy requirements to reduce GHG emissions, increase renewable clean energy supply, and promote development of the offshore wind industry. Additionally, the Project will provide multiple economic and reliability benefits to the Commonwealth and the region. The Project was chosen through the legislature-approved procurement process because it will contribute to the energy needs of the Commonwealth and the region and it provides substantial public benefits. Mayflower Wind seeks approval to construct the Project. The Siting Board should grant such approval because the Project conforms to the Siting Board's standards under G.L. c.164, § 69J on need, alternatives, routing, minimization of environmental impacts and costs, and consistency with the Commonwealth's policies, as set forth further herein.

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2 PROJECT NEED

The purpose of the Project is to deliver renewable clean energy of approximately 1,200 MW of Mayflower Wind Clean Energy Resource to Massachusetts and the New England region. Mayflower Wind is developing the Project in accordance with the need for clean energy and offshore wind established under federal and New England state public policy requirements to reduce GHG emissions and increase the supply of renewable clean energy from offshore wind generation, including those public policies and legislative directives of the Commonwealth, as further described in Section 6 of this Analysis. The Project is needed to interconnect the Clean Energy Resource to the regional transmission system and enable delivery of its energy output to Massachusetts and the New England region. Additionally, indicators of progress demonstrate that the Clean Energy Resource will be available to contribute to the regional energy supply. The Project also includes a Noticed Variation, as described in Sections 1, 4 and 5 of this Analysis, that would facilitate the delivery of energy from an additional estimated 1,200 MW of energy by "right-sizing" certain facilities (primarily trenching and conduit for the onshore export cables) to minimize any likely siting, costs and environmental impacts and meet future need. As described in Section 1, the Project is comprised of new Massachusetts-jurisdictional offshore and onshore export cables and transmission lines and certain ancillary structures, including an HVDC converter station, necessary to deliver energy generated by the Clean Energy Resource to Massachusetts and the regional power grid. Further details of the Project are described in Section 1 of this Analysis.

The need for the Project is driven by the laws and public policies of Massachusetts and the New England region and demonstrated by the indicators of Mayflower Wind's development progress and commitments described further below.

2.1 SUPPORTING MASSACHUSETTS LEGISLATION AND POLICIES

Massachusetts legislation and policies support the need for the Project. As discussed in the sections that follow, regional climate change and clean energy related policies, including those of the Commonwealth, drive the need for the Project. The Commonwealth has strong public policy requirements to reduce GHG emissions, increase renewable clean energy supply, and develop the offshore wind energy industry for the benefit of the Commonwealth and its residents. In making its decisions about this Project and other transmission infrastructure designed to deliver the renewable clean energy from offshore wind projects to Massachusetts and the regional grid, the Siting Board should consider the public policies cited below, and others like them, as part of the basis for establishing the need for the Project. These public policies are described in further detail in Section 6 of this Analysis.

2.1.1 Climate Change Legislation and Policies

- Global Warming Solutions Act: The Massachusetts Global Warming Solutions Act (GWSA), enacted in 2008, established aggressive GHG emission reduction targets mandating the Commonwealth reduce its GHG emissions between 10 percent and 25 percent from 1990 levels by 2020 and by at least 80 percent from 1990 levels by 2050 (c. 298 of the Acts of 2008). Among other provisions, the GWSA obligates administrative agencies such as the Siting Board to consider reasonably foreseeable climate change impacts (e.g., additional GHG emissions) and related effects (e.g., sea level rise) in evaluating and issuing permits.
- An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy: (c. 8 of the Acts of 2021 [2021 Climate Act]). The 2021 Climate Act further commits and moves Massachusetts forward to a clean energy future. It builds on the GWSA and sets an ultimate emissions goal of "at least net zero statewide greenhouse gas emissions" by 2050. The 2021 Climate Act directs

the Secretary of the Executive Office of Environmental Affairs (EEA), in consultation with the DOER, to set GHG emissions limits for 2025, 2030, 2035, 2040, 2045, and 2050. The 2021 Climate Act also increases the offshore wind procurement authorization under Section 83C by an additional 2,400 MW of offshore wind, bringing Massachusetts' total target to 5,600 MW, to be procured no later than June 30, 2027.[1]

The Project is both consistent with, and directly advances, the Commonwealth's policies for developing offshore wind energy resources. The Project satisfies the legislative directives of the *2021 Climate Act* by providing for the delivery of energy of approximately 1,200 MW from the Clean Energy Resource into the Commonwealth and the region that can serve commitments under existing Mayflower Wind Section 83C II and III Power Purchase Agreements (PPAs) and future procurements.

- Net Zero Policy: On January 21, 2020, Governor Baker, in his State of the Commonwealth address, announced a goal of net-zero GHG emissions by 2050. On February 26, 2020, the EEA released a Draft Letter of Determination with proposed language to set a 2050 GHG limit designed to achieve net-zero GHG emissions. Extensive comments were received from interested stakeholders on the draft.[2] On Earth Day, April 22, 2020, EEA Secretary Theoharides signed the Letter of Determination, setting the 2050 emissions limit as follows: "A level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level."[3]
- 2050 Decarbonization Roadmap: Offshore wind is poised to play a major role in Massachusetts' efforts to address climate change and protect the Massachusetts economy. On December 30, 2020, the EEA released its 2050 Decarbonization Roadmap that laid out pathways towards the Commonwealth's target of Net Zero GHG emissions by 2050.[4] Secretary Theoharides stated in this 2050 Roadmap:

  > To achieve this [net-zero] target in a cost-effective and equitable manner, the Baker-Polito Administration launched a comprehensive process to chart pathways and strategies to meet this ambitious commitment. The resulting process, culminating in the 2050 Decarbonization Roadmap, included significant stakeholder engagement, science-based analysis, and a focus on reducing costs for residents and businesses while maintaining a healthy, thriving economy.

  Addressing climate change will also protect the Massachusetts economy, as analysis from the United States Environmental Protection Agency (USEPA) in 2015 found that reducing emissions will save the Northeast region at least $3 billion per year by 2050 and $42 billion per year by

[1] When submitting amendments on the bill before signing it into law, Governor Baker stated in a letter to the legislature, "significant amounts of offshore wind, as much as 15 GW, will be necessary to reach the Commonwealth's net zero limit. We recognize that more work is needed to ramp up offshore wind development in Massachusetts and to provide clean, affordable power to residents." Letter from Massachusetts Governor Charles D. Baker to the Senate and House of Representatives (Feb. 7, 2021), available at https://d279m997dpfwgl.cloudfront.net/wp/2021/02/S9-Time-Stamped-Amendment-Letter.pdf.

[2] Mass. Exec. EEA, Request for Comment (February 2020), available at mass.gov/doc/draft-letter-of-determination-on-the-2050-emissions-limit-revised-342020/download.

[3] EEA, Determination of Statewide Emissions Limit for 2050, at 1 (April 2020), available at mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download.

[4] EEA, Massachusetts 2050 Decarbonization Roadmap, at 4 (December 2020), available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.

2090. The 2050 Decarbonization Roadmap also makes clear that achieving Net Zero emissions will lead to the creation of thousands of local jobs while dramatically improving air quality and public health.[5]

The 2050 Decarbonization Roadmap emphasizes that the "deployment of renewable energy resources is the foundational step in developing a low-cost and largely decarbonized energy supply for Massachusetts."[6] The development of offshore wind not only provides an affordable, clean energy resource for the Commonwealth, but also the region more broadly.[7] Offshore wind must be deployed at scale (at least 15 to 20 GW installed) in the Commonwealth over the next 30 years.[8]

- Interim Clean Energy and Climate Plan for 2030: In conjunction with the 2050 Decarbonization Roadmap, the EEA also released the Interim Clean Energy and Climate Plan for 2030.[9] This Interim Plan builds upon the 2050 Decarbonization Roadmap, finding that the most cost-effective and low-risk paths to net-zero emissions by 2050 include a "balanced clean energy portfolio anchored by significant offshore wind resources," as well as increased transmission abilities so clean power can be delivered to Massachusetts, and widespread electrification of transportation and building heating.[10] The Interim Plan anticipates that offshore wind will be the "primary source of electricity for a decarbonized energy system" in Massachusetts.[11] To get there over the next decade, Massachusetts needs to, among other things, start getting clean power from the offshore wind projects already in the pipeline.[12]
- DOER Clean Energy Regulation Updates: In 2020 and 2021, DOER promulgated or updated many of its regulatory programs aimed at incentivizing clean energy resources. In 2020, DOER promulgated the first-in-the-nation Clean Peak Energy Standard, a program designed to incentivize clean energy to supply power when demand is at its greatest.[13] DOER likewise expanded the existing Solar Massachusetts Renewable Target program by an additional 1,600 MW and updated its regulations to further spur the development of solar photovoltaic and battery energy storage facilities in the Commonwealth.[14] In 2021, DOER updated its Class I and Class II Renewable Portfolio Standard regulations to increase deployment of clean energy resources in the Commonwealth.[15]

2.1.2 Offshore Wind Procurement Legislation, Policies, and Solicitations

- Offshore Wind Procurement Legislation: In connection with its clean energy and climate change policies, in 2016, the Commonwealth enacted a legislative mandate, Section 83C of the Green Communities Act (c. 169 of the Acts of 2008), as amended by An Act to Promote Energy

[5] *Id*.
[6] *Id.* at 65. EEA Secretary Katie Theoharides stated, "Offshore wind is an absolutely critical part of a low-cost strategy to achieve net-zero emissions. By 2050, we're looking at something on the order of 25 GW [gigawatts] of offshore permitted and operating off of our coasts. We look forward to efforts to work with the incoming administration to ensure the two projects -- the Vineyard Wind project and the Mayflower Wind project -- that we have in the pipeline get permitted and built expeditiously, and that we can work with the administration on the siting of new lease areas that balance environmental impacts with this great energy resource we have off our coasts." Colin A. Young, *Baker Emissions Roadmap Envisions "Decade for Action" Theoharides: Economy Can Thrive Amidst Major Changes*, State House News Service (Dec. 30, 2020) https://www.statehousenews.com/email/a/20202700?key=534135e.
[7] 2050 Decarbonization Roadmap at 65.
[8] *Id*. at 55.
[9] EEA, Interim Clean Energy Climate Plan for 2030 (December 2020), available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download.
[10] EEA, Interim Clean Energy Climate Plan for 2030, at 5 (December 2020), available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download.
[11] *Id.* at 36.
[12] *Id.* at 38, 42; *see also* 2050 Decarbonization Roadmap at 55, 57, 65.
[13] 225 Code of Massachusetts Regulations (CMR) 21.00.
[14] 225 CMR 20.00.
[15] 225 CMR 14.00; 225 CMR 15.00.

Diversity (c. 188 of the Acts of 2016) (Energy Diversity Act) that distribution companies jointly and competitively solicit proposals for offshore wind energy generation for an initial aggregate nameplate capacity of 1,600 MW. In addition, in 2018, An Act to Advance Clean Energy (c. 227 of the Acts of 2018, § 21), authorized the DOER to solicit another 1,600 MW for a total of 3,200 MW of offshore wind procurement, pending a DOER study about the "necessity, benefits and costs" of doing so. The DOER's study showed that, among other findings, an additional procurement for 1,600 MW of offshore wind energy has "a likelihood of cost-effectiveness that justifies additional solicitations," and the DOER required the Massachusetts electric distribution companies (EDCs) to solicit an additional 1,600 MW of offshore wind energy.[16] The Energy Diversity Act and its Section 83C solicitations recognize the necessity of achieving the goals established by the Commonwealth pursuant to the GWSA. The 2021 Climate Act increased the total offshore wind procurement target by an additional 2,400, bringing the State's total commitment to 5,600 MW. As of May 24, 2022, there is a bill pending in the Massachusetts legislature (H.4524, *An Act Advancing Offshore Wind and Clean Energy*) that, if enacted, would further strengthen the Commonwealth's commitment to offshore wind.

- 2019 Offshore Wind Solicitation: In accordance with Section 83C II of the Massachusetts Energy Diversity Act of 2018, which amended the Green Communities Act (Section 83C), EDCs serving Massachusetts customers issued in 2019 an Offshore Wind Energy Generation request for proposals (Section 83C II RFP). Mayflower Wind submitted a bid in response to the Section 83C II RFP and the 804 MW proposal was selected as the winning bid in October 2019. Mayflower Wind executed PPAs with the EDCs in December 2019 and the EDCs submitted those PPAs for approval with the DPU in January 2020. By order dated November 5, 2020, the DPU approved the PPAs.
- 2021 Offshore Wind Solicitation: The EDCs issued a third offshore wind solicitation (Section 83C III) on May 7, 2021 (Section 83C III RFP). The EDCs did so in accordance with the authority granted to the DOER by An Act to Advance Clean Energy to require the EDCs to jointly and competitively conduct additional offshore wind generation solicitations and procurements, subject to the required solicitation and procurement process of said Section 83C, to ensure that the EDCs enter into cost-effective contracts for Offshore Wind Energy Generation equal to an additional estimated 1,600 MW of aggregate nameplate capacity not later than December 31, 2035. On September 16, 2021, Mayflower Wind submitted a confidential bid in response to the 2021 Offshore Wind RFP and followed with submission of a public bid on September 23, 2021. On December 17, 2021, it was announced that Mayflower Wind's 400 MW proposal was selected as a winning bidder in the 83C III solicitation. Mayflower Wind will participate in other future offshore wind solicitations, which will provide further impetus for Mayflower Wind's development of its Clean Energy Resource.
- In announcing the 83C III winning bidders, EEA Secretary Kathleen Theoharides told the News Service on December 17, 2021:

> These projects [Mayflower Wind and Vineyard Wind] will double the size of our current offshore wind procurements, they will deliver significant economic benefits to a number of coastal communities across the commonwealth, they include important provisions for diversity, equity and inclusion as well as benefits to environmental justice communities, and they invest significantly in the state while balancing protections with environmental resources including fisheries.[17]

[16] Mass. DOER, Offshore Wind Study, at 5-6 (May 2019), available at https://www.mass.gov/doc/offshore-wind-study.
[17] Colin A. Young, *State Picks Both Bidders for Next Round of Offshore Wind, Doubles Amount of Power in Pipeline*, State House News Service, (December 17, 2021) https://www.wcvb.com/article/state-picks-both-bidders-for-next-round-of-offshore-wind/38553696#.

2.1.3 Additional Regional and Federal Public Policies

In addition to serving the needs of Massachusetts, the Project is also being proposed in response to, and directly advances, several regional and federal public policies supporting offshore wind. The Project contributes substantially to the transformation of the New England energy system to a carbon-free renewable energy system, as supported by these policies. With a regional system more heavily dominated by renewables, all New England states will be better able to attain their renewable clean energy goals.

- In March of 2021, the United States Departments of Interior, Energy, and Commerce announced a shared goal to deploy 30 gigawatts of offshore wind in the United States by 2030.
- On March 28, 2022, the Federal Energy Regulatory Commission issued its "Strategic Plan" for fiscal years 2022-2026, in which it describes as a strategic priority "Facilitating the Development of the Electricity Infrastructure Needed for the Changing Resource Mix."[18]
- On April 21, 2022 the Federal Energy Regulatory Commission (the "Commission") issued a Notice of Proposed Rulemaking in Docket No. RM21-17-000 on "Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection." The Notice of Proposed Rulemaking requires, among other things, planning for future changes to the resource mix and demand, with a focus on planning transmission infrastructure for the clean energy future.
- Neighboring coastal states of Massachusetts, Connecticut and Rhode Island, also have strong public polices to reduce GHG emissions and increase clean energy supply, including from offshore wind generation. For example, in Rhode Island, the *2021 Act on Climate* sets mandatory and enforceable targets for reducing GHG emissions and transitioning to a low carbon economy and requires that the Rhode Island Executive Climate Change Coordinating Council update the Greenhouse Gas Emissions Reduction plan to develop a plan to reduce climate emissions to net-zero by 2050. Rhode Island also has the Energy 2035 plan which emphasizes the significant importance of offshore wind in achieving the states' renewable energy goals.[19] The *Connecticut Global Warming Solutions Act* established a requirement for the state to reduce the level of economy-wide GHG emissions to 10 percent below the 1990 levels by 2020, 80 percent below 2001 levels by 2050 and the interim target of 45 percent below 2001 levels by 2030.[20]

2.2 NEED FOR THE MAYFLOWER WIND PROJECT

For the public policy reasons cited above, and based on the indicators of progress described below, Mayflower Wind has demonstrated that there is a need for the Project to interconnect its Clean Energy Resource and enable delivery of its clean energy to Massachusetts and the regional transmission grid.

The Siting Board's review of proposed transmission facilities is conducted pursuant to G.L. c. 164, § 69J. In reviewing petitions for such facilities, the Siting Board is charged with the responsibility for implementing energy policies to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost. In carrying out this statutory mandate with respect to proposals to construct electric transmission facilities in the Commonwealth, the Siting

[18] *Strategic Plan* at 10, 12, file:///H:/Downloads/FERC%20FY22-26%20Strategic%20Plan_3-29-2022.pdf.
[19] Rhode Island Division of Planning, *Energy 2035: Rhode Island State Energy Plan* (2015) http://www.planning.ri.gov/documents/LU/energy/energy15.pdf.
[20] CT Public Act 08-98.

Board is required to evaluate, among other things, whether there is a need for additional transmission resources. (G.L. c. 164, §§ 69H, 69J).

The Siting Board requires an applicant seeking to construct a transmission line to interconnect a new or expanded generating facility to show: (1) that the existing transmission system is inadequate to interconnect the new or expanded generator; and (2) that the new or expanded generator is likely to be available to contribute to the regional energy supply.[21]

To show that the new or expanded generator is "likely to be available" the Siting Board has developed standards that vary according to the status of the generator:

> If the new or expanded generator exists, or is under construction, the availability showing will be deemed to have been made. If the generator is planned, and is subject to the Siting Board's jurisdiction, that showing may be made by obtaining the Siting Board's approval of the generating facility. *If the generator is planned, and not subject to the Siting Board's jurisdiction, the showing may be made on a case-by-case basis based on indicators of project progress (e.g., progress in permitting or in obtaining project financing*) (Emphasis added).[22]

While the Project fully meets this standard, developed by the EFSB in the *Cape Wind* decision 17 years ago, the standard itself could appropriately be refined and improved by expressly taking into account public policies and legislative directives driving the need for transmission infrastructure to integrate public policy generation resources, such as offshore wind, into the regional grid. Such refinement of the standard would be appropriate given the legislative changes, including decarbonization mandates, that have occurred since the development of the *Cape Wind* standard in 2005.

2.2.1 Adequacy of Existing Transmission System

The Existing Transmission System is Inadequate to Interconnect the Clean Energy Resource.

Mayflower Wind's Clean Energy Resource is approximately 51 nautical miles (94 km) offshore from Brayton Point in Somerset. There is no existing electric infrastructure serving the Lease Area, and no transmission to which the Clean Energy Resource can interconnect without new transmission being built. Therefore, the existing transmission system is inadequate to interconnect Mayflower Wind's Clean Energy Resource and new transmission is needed to interconnect it to the electrical grid.

In developing this new transmission in the Project, and as described in Sections 4 and 5 of this Analysis, Mayflower Wind has engaged in an extensive analysis of offshore and onshore routing alternatives to avoid and/or mitigate impacts while enabling delivery of energy from an estimated 1,200 MW to the point of interconnection at Brayton Point.

2.2.2 Regional Energy Supply Contribution

The Mayflower Wind Clean Energy Resource will be available to contribute to the regional energy supply.

The Mayflower Wind Clean Energy Resource is not subject to the Siting Board's jurisdiction because of its location in federal waters. Consequently, consistent with Siting Board precedent, Mayflower Wind may demonstrate that the Clean Energy Resource is likely to be available based on indicators of progress. As listed below, the indicators of progress clearly demonstrate that the Clean Energy Resource is likely to be available and that, therefore, there is a need for the Project.

[21] *Cape Wind Associates, LLC, and Commonwealth Electric Company d/b/a NSTAR Electric*, EFSB 02-2, at 16-17 (2005) ("*Cape Wind*"); *Vineyard Wind LLC*, EFSB 17-05/D.P.U. 18-18/18-19, at 11 (2019) ("*Vineyard Wind 1*").
[22] Cape Wind at 16-17; Vineyard Wind 1 at 12.

In addition to the specific indicators of progress, strong public policy drives the need for and supports the successful development of the Clean Energy Resource, making it likely to be fully developed. Such policies are noted in Section 2.1 above and are described in further detail in Section 6 of this Analysis.

Along with these policies driving the need for and supporting the development of Mayflower Wind's Clean Energy Resource, there are multiple Project-specific indicators of progress that demonstrate that the Mayflower Wind Clean Energy Resource is likely to be available to contribute to the regional energy supply. These indicators of progress include, without limitation, the following:

- On December 13-14, 2018, the BOEM held a competitive lease sale for Wind Energy Areas offshore of Massachusetts. Mayflower Wind Energy LLC was identified as the winner of Lease Area OCS-A 0521 (127,388 ac [51,552 ha]), which is located 26 nm (48 km) south of Martha's Vineyard and 20 nm (37 km) south of Nantucket and was awarded a lease. The lease area has the potential to generate an estimated 2,400 MW of low-cost clean energy, or enough to power nearly 800,000 homes. The commercial wind energy lease OCS-A 0521 issued by BOEM on March 26, 2019, took effect on April 1, 2019.
- Mayflower Wind has taken multiple steps and made multiple commitments to interconnect the full capacity (an estimated 2,400 MW) from its Clean Energy Resource. On April 13, 2021, and April 16, 2021, Mayflower Wind filed two interconnection requests for queue positions (QP) to ISO-NE, the new queue positions, QP 1116 and QP 1121 connect into the New England Power Company d/b/a National Grid (National Grid) Brayton Point 345-kV substation. Each Queue Position is for 1,200 MW. In addition, on May 27, 2021, Mayflower Wind acquired an existing QP 837. QP 837 is an elective transmission upgrade (ETU) which will bring approximately 1,200 MW of capacity from the Clean Energy Resource to the Brayton Point substation through the use of HVDC technology. Mayflower Wind's generator interconnection request, QP 1116, will utilize QP 837 to connect to the ISO-NE system. QP 837's ISO-NE studies established that 1,200 MW of offshore wind could safely and reliably connect to the transmission system. Currently the QP 837-related ETU Interconnection Agreement is undergoing negotiations between ISO-NE, National Grid and Somerset WindLink LLC, a wholly owned subsidiary of Mayflower Wind. A few issues remain which are progressing to resolution allowing the agreement to be executed sometime in June.
- In the Cape Cod area, Mayflower Wind submitted two interconnection requests for queue positions on December 18, 2018, QP 829, for 1,000 MW interconnecting at a proposed new 345-kV substation in Bourne, connecting to the existing NSTAR Electric Company d/b/a Eversource Energy (Eversource) 345-kV lines 322 and 342 and QP 830, for 860 MW interconnecting at the Eversource West Barnstable 345-kV substation. On September 3, 2019, Mayflower Wind requested its third queue position on Cape Cod, QP 922. QP 922 uses the same point of interconnection as QP 829 increasing the Bourne interconnection by 200-MW for a total of 1,200 MW. On February 3, 2022, Mayflower Wind submitted its fourth interconnection request for a queue position, QP 1225 connecting at Bourne to explore an HVDC option to Cape Cod. On August 29, 2021, Mayflower Wind modified QP 829 from 1,000 MW to 400 MW at the request of ISO-NE to participate in the first Cape Cod first Resource Integration Study, commonly referred to as Cluster Study 1. Related to all of these interconnection requests, Mayflower Wind has made financial deposits/payments of over $9.2 million and committed significant time and resources to facilitating the associated ISO-NE studies.
- Related to all of these interconnection requests, Mayflower Wind has made financial deposits/payments of over $9.2 million and committed significant time and resources to facilitating the associated ISO-NE studies. ISO-NE has completed Feasibility Studies for QP 829, 830, 922, 837, and 1116. It has completed the System Impact Study and Facilities Study for QP

837. Currently the QP 837-related Interconnection Agreement is under negotiations between ISO-NE, National Grid and Mayflower Wind.

- In October 2019, Mayflower Wind was selected as the winning bidder in the Section 83C II offshore wind solicitation with its 804 MW proposal. In December 2019, Mayflower Wind successfully completed negotiations of and entered into long-term PPAs between the EDCs and Mayflower Wind for 804 MW from the Clean Energy Resource. On November 5, 2020, the DPU approved the PPAs, [23] and in so doing stated that the EDCs "have adequately demonstrated Project viability in a commercially reasonable timeframe."[24]
- On February 15, 2021, Mayflower Wind filed its COP with BOEM, the lead federal permitting agency and the agency responsible for completing the National Environmental Policy Act (NEPA) process. On August 30, October 28, 2021, and March 16, 2022, Mayflower Wind filed revisions and updates to its COP and responded to BOEM environmental and engineering comments. On November 1, 2021, BOEM published a Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) for the review of the Mayflower Wind COP.[25] The COP, when approved, would allow for the development of an estimated 2,400 MW in the Mayflower Wind Lease Area.
- On August 30, 2021, Mayflower Wind submitted a $13.96 million deposit for the interconnection of 1,000 MW, thereby financially committing to the interconnection cluster for Cape Cod under the Tariff rules of ISO-NE for interconnection clusters for its QP 829. Since the Cluster Study was oversubscribed, Mayflower Wind lowered the interconnection to 400 MW in order to participate in the next phase of the Cluster Study. ISO-NE has since returned $8.4 million of the deposit to reflect the change from 1,000 MW to 400 MW.
- On September 16, 2021, Mayflower Wind submitted an additional bid in response to the Section 83C III offshore wind solicitation to sell additional capacity from its Clean Energy Resource, thereby providing additional revenue assurance for and financial obligations on Mayflower Wind for the development of the Clean Energy Resource. On December 17, 2021, it was announced that Mayflower Wind's 400 MW proposal was selected as a winning bid in the 83C III solicitation. On April 15, 2022, Mayflower Wind and the EDCs executed PPAs for the 400 MW 83C III award. Mayflower Wind currently has 1,200 MW of executed PPAs to support the need for the Project. This offshore wind energy solicitation, and others that are likely to follow, provide further strong impetus for Mayflower Wind's development of its Clean Energy Resource.
- Mayflower Wind has engaged in productive discussions with the Brayton Point property owner, Town of Somerset leadership, and the Brayton Point neighborhood.
- Mayflower Wind has leased office space at 99 South Main Street in downtown Fall River, a short walk to the Fall River waterfront and a convenient drive to both New Bedford and Brayton Point in Massachusetts and Portsmouth, Rhode Island.
- Mayflower Wind has committed that at least 75 percent of O&M jobs will be hired locally, with the majority traveling out to the offshore wind Lease Area regularly, either on Fall River based

[23] On February 10, 2020, Eversource, National Grid, and Fitchburg Gas and Electric Light Company d/b/a Unitil ("Unitil") (collectively, "Companies") each filed a petition with the DPU, pursuant to the Green Communities Act, St. 2008, c. 169, § 83C ("Section 83C") and 220 CMR 23.00, for approval of two long-term contracts to purchase offshore wind energy generation and associated renewable energy certificates. The DPU docketed the Eversource petition as D.P.U. 20-16, the National Grid petition as D.P.U. 20-17, and the Unitil petition as D.P.U. 20-18. The DPU issued an order on November 5, 2020 approving the contracts between Mayflower Wind and National Grid, Eversource and Unitil.
[24] Petition of NSTAR Electric Company et al., for approval of long-term contracts for procurement of Offshore Wind Energy Generation, pursuant to Section 83C of An Act Relative to Green Communities, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12, Mass. D.P.U. 20-16, 20-17, 20-18 at 36 (Nov. 5, 2020), available at https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/12850683.
[25] 86 Fed. Reg. 60,270 (Nov. 1, 2021) available at https://www.boem.gov/sites/default/files/documents/about-boem/regulations-guidance/86-FR-60270.pdf.

service operations vessel, on which workers live on-board for weeks at a time, or the New Bedford based crew transfer vessels that will shuttle back and forth on a daily basis.

- Mayflower Wind has executed a lease option with the Massachusetts Clean Energy Center (MassCEC) for the use of the New Bedford Marine Commerce Terminal as a staging and deployment base during construction.
- As part of the successful partnership with the MassCEC in the Section 83C II and III bids, Mayflower Wind has committed to invest $115 million in initiatives that will help make the Commonwealth and the SouthCoast of the New England region a hub for offshore wind. This total investment is based on commitments made under the Massachusetts offshore wind procurement awards:
    - $42.4 million, offered under the Section 83C III solicitation, with a focus on education, training, and workforce development; diversity, equity and inclusion; and low-income ratepayer support.
    - $77.5 million, offered under the Section 83C II solicitation, that set a framework towards ports and infrastructure improvements; workforce training and development; applied research and innovation; marine science; and low-income ratepayer support.
- Mayflower Wind has committed to invest $72.5 million over 25 years in programs administered by MassCEC that help make the Commonwealth a hub for offshore wind energy including $35 million towards ports and infrastructure, $10 million towards innovative technologies, $5 million towards workforce development, $5 million towards applied research, $10 million towards direct support for marine science, and $7.5 million towards operation and maintenance port upgrades. In addition, Mayflower Wind has committed $5 million to the Cape Light Compact Joint Powers Entity, the energy services organization operated by twenty-one towns on Cape Cod and Martha's Vineyard, towards strategic electrification to reduce electric bills for low-income customers.
- As part of Mayflower Wind's award of a 400 MW power purchase agreement through the Commonwealth's 83C III offshore wind energy procurement, Mayflower Wind has committed to spend up to $42.3 million through its economic development package. The total package will support the building of the offshore wind supply chain; provide for education and training of an offshore wind workforce; make significant investments in local ports, businesses, and infrastructure; as well as offer diversity, equity and inclusion measures that include the hiring of specialized firms and support for low-income electric consumers, among other measures. The package includes $27 million over 10 years to the SouthCoast Community Foundation, and other binding partnerships with Gadding-Hearn Shipyard, Bristol Community College's National Offshore Wind Institute, Massachusetts Maritime Academy, National Society of Black Engineers Boston Professionals, MassHire Greater New Bedford Workforce Board, Buzzards Bay Area Habitat for Humanity, RPS and the SouthCoast LGBTQ+ Network.
- As a result of the extension of federal Offshore Wind Energy Investment Tax Credits in January 2021, Mayflower Wind announced that the cost of power in the Section 83C II PPAs will drop even further. This price reduction likely means that the customers of three Massachusetts electric utilities can expect to save over $25 million each year, resulting in a half a billion dollars in lower electric bills over the life of the 20-year contracts.
- Mayflower has conducted and continues to conduct extensive geophysical, geotechnical, and benthic surveys of the Lease Area and export cable routes in both federal and state waters. These campaigns conducted in 2019, 2020, 2021, and 2022 are in support of state and federal

permitting requirements, including characterization of sensitive habitat, and are intended to support design efforts and provide data in support of archeological clearance.

As stated above, Mayflower Wind received an NOI from BOEM on November 1, 2021, commencing the EIS scoping process for the Mayflower Wind COP. The BOEM Record of Decision (ROD) will provide further assurance that Mayflower Wind's Clean Energy Resource is likely to become available to contribute the regional energy supply. Mayflower Wind commits to submitting to the Siting Board, prior to commencing construction, a copy of the BOEM ROD approving the Mayflower Wind Clean Energy Resource and related facilities. Prior to issuance of the ROD, Mayflower Wind will provide to the Siting Board information regarding the EIS as it becomes available.

Other significant indicators that progress has already been achieved, and will continue to be achieved during the review of this Petition demonstrating that Mayflower Wind's Clean Energy Resource is "likely to be available" to contribute to the regional energy supply include:

- BOEM vetted and pre-authorized offshore areas as suitable and desirable for offshore wind development and provided information demonstrating that the subject areas have characteristics that make them desirable for the development of offshore wind generation. Specifically, Lease Area OCS-A 0521, in which the offshore wind energy generation facility for Mayflower Wind will be built, was delineated through a robust review process involving significant public input over several years, a process intended to select an area that addressed concerns and was appropriate for offshore wind generation. That process culminated in the award of Lease Area OCS-A 0521 to Mayflower Wind.
- On May 26, 2020, BOEM approved the Project Site Assessment Plan,[26] and Mayflower Wind installed a meteorological-oceanographic buoy that has provided data used to inform the design and permitting strategy for Mayflower Wind.
- There has been early and extensive outreach conducted by Mayflower Wind to stakeholders at the planning stages of Project development. For example, Mayflower Wind has met with numerous fishing groups and/or individuals, and the Commonwealth has participated in ongoing working groups for fisheries and habitat concerns. Mayflower Wind has a full time Fisheries Liaison Officer on its team and three Fisheries Representative organizations including the Massachusetts Lobstermen's Association, the New Bedford Port Authority, and the Commercial Fisheries Center of Rhode Island to collaborate on initiatives that minimize impacts to fisheries in the Project area. Mayflower Wind has met with the local federally-recognized Native American Tribes numerous times and conducted regular outreach to local municipalities, groups, and individuals on the SouthCoast and in the Cape and Island communities. In advance of ongoing nearshore surveys in Mount Hope Bay and the Taunton River, Mayflower Wind informs the harbormasters and operators of marinas, boatyards, yacht clubs, and other boating centers in Somerset and Fall River. Section 1 provides information about Mayflower Wind's ongoing outreach efforts.
- A third-party EIS contractor has been selected to support BOEM in reviewing the COP and producing the NEPA documents. As mentioned, BOEM issued an NOI to conduct an EIS for the Mayflower Wind Project on November 1, 2021. BOEM has indicated that they plan to issue a ROD within several months after the issuance of a Final EIS under NEPA. Additional permitting

[26] Mayflower Wind Energy LLC, Site Assessment Plan for Mayflower Wind Lease OCS-A 0521 (July 29, 2019) https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/massachusetts/Mayflower-Site-Assessment-Plan.pdf/ *See also* BOEM, Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Rhode Island and Massachusetts: Revised Environmental Assessment (2013) https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/Renewable_Energy_Program/State_Activities/BOEM%20RI_MA_Revised%20EA_22May2013.pdf.

with the USEPA, the United States Army Corps of Engineers (USACE), the United States Coast Guard (USCG), the National Marine Fisheries Service (NMFS), and United States Fish and Wildlife Service (USFWS) has been initiated to facilitate approvals either prior to, or in the same time frame, as the state permitting is expected to be completed.

- As of the time of the filing of this Petition with the Siting Board Mayflower Wind plans to participate in the ISO-NE Forward Capacity Market by bidding into and clearing in future Forward Capacity Auctions, thereby providing additional financial incentives and obligations for the development of the Clean Energy Resource.
- Mayflower Wind is a Covered Project under Title 41 of the Fixing America's Surface Transportation Act (FAST-41). FAST-41 maintains a permitting dashboard to keep regulators and stakeholders up to date on federal, state, and local permitting milestones and timelines associated with the Mayflower Wind Project.[27]
- As of the time of the filing of this Petition with the Siting Board Mayflower Wind completed a MEPA Environmental Notification Form for the Project. Mayflower Wind expects to file this ENF in the near future.

2.3 CONCLUSION

Based on the reasons set forth above, Mayflower Wind has demonstrated and will be able to further demonstrate that the Project is needed to deliver energy from the Clean Energy Resource, that public policies and legislative directives drive the need for the Project, and that the Mayflower Wind Clean Energy Resource is likely to be available to contribute to the regional energy supply. Therefore, Mayflower Wind has met the standard for demonstration of need in accordance with G.L. c. 164 §§ 69H, 69J and Siting Board precedent.

[27] The Mayflower Wind permitting dashboard is located at: https://www.permits.performance.gov/permitting-project/mayflower-wind-energy-project.

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3 PROJECT ALTERNATIVES

The Project, which is the subject of this Petition, includes new Massachusetts-jurisdictional offshore and onshore transmission facilities necessary to deliver the renewable clean energy generated by Mayflower Wind's Clean Energy Resource to Massachusetts and the regional electric power grid. Specifically, this includes the offshore and onshore export cables in Massachusetts, a new onshore HVDC converter station, and 345-kV HVAC underground transmission lines to be constructed to interconnect to the New England regional electric grid at Brayton Point in the Town of Somerset, Massachusetts, as further described in Section 1.

In accordance with G.L. c. 164 § 69J, this section describes the alternatives to the Project as well as the methods used to evaluate these alternatives. Section 69J specifies that the following information shall be provided, including "a description of the alternatives to the facility, such as other methods of transmitting or storing energy, other site locations, other sources of electrical power or gas, or a reduction of requirements through load management." The regulations require that the Project proponent develop and apply a reasonable set of criteria for identifying and evaluating alternative routes in a manner that ensures that is has not overlooked or eliminated any routes that are, on balance, clearly superior to the proposed project, and identified a reasonable range of practical facility siting alternatives with some measure of geographic diversity.

This Project is being proposed in response to specific legislative and regulatory mandates and executive policies for climate change response, clean energy and utility-scale offshore wind generation as described in Sections 1, 2 and 6 of this Analysis. The purpose of the Project is to deliver approximately 1,200 MW of renewable clean energy from Mayflower Wind's Clean Energy Resource to Massachusetts and to the New England regional electric grid. This reliable resource will significantly increase the renewable clean energy supply available to Massachusetts consumers, substantially reduce GHG emissions across the region, supplement or displace electricity generated by fossil fuel-powered plants, improve energy system reliability and security, and enhance economic competitiveness by reducing long-term energy costs, attracting new investments, and creating job growth. The Project's extensive environmental and economic benefits are discussed in more detail in Section 1.5.

The Project will advance the strong public policies of the Commonwealth and the region with respect to reducing GHG emissions, increasing clean energy supply, especially from offshore wind, and fostering the development of a robust offshore wind industry, as called for in legislation and other public policies detailed in Sections 2 and 6 of this Analysis. The Project is being developed partly in response to specific legislation for the procurement of offshore wind energy under long-term contracts with the electric distribution companies.[1] Additionally, the Clean Energy Resource that the Project will develop is in a specific offshore lease area (OCS-A 0521) obtained through the BOEM lease auction process, pursuant to federal policy to promote offshore wind development. Accordingly, because of this public policy need and impetus for the Project, and the specific location where the Clean Energy Resource must be sited, a more traditional Project alternative analysis that might look at other generation technologies and locations is not applicable.

New transmission facilities are needed to connect Mayflower Wind's Clean Energy Resource to the New England regional electric grid. As such, no-action and non-transmission alternatives would not address the identified need articulated in Massachusetts law and policy. Mayflower Wind does, however, examine some alternatives applicable to the Project. Alternative offshore and onshore transmission routes and interconnection locations are discussed in greater detail in Section 4 of this Analysis. This

[1] Section 83C of the Green Communities Act (Chapter 169 of the Acts of 2008), as amended by Chapter 188 of the Acts of 2016, An Act to Promote Energy Diversity.

section of the Analysis describes the alternatives to the construction of the Project that Mayflower Wind evaluated, including a "no-action" option, and related alternatives and potential transmission alternatives (e.g., different cable configurations and POIs).The following evaluation of alternatives demonstrates that the Project as proposed is the superior alternative to meet the identified need, with a minimum impact on the environment, while providing a great degree of reliability at the lowest possible cost.

3.1 ALTERNATIVES CONSIDERED

In accordance with the requirements of the law and Siting Board standards, Mayflower Wind evaluated alternatives to the Project. An important goal in the planning and development of the Clean Energy Resource and the transmission connector facilities, including the offshore components within state waters, and onshore components in Massachusetts, was to ensure that the selected routes, landfalls and POI, are the most appropriate in terms of cost and reliability, and that environmental impacts are avoided, or minimized and mitigated to the fullest extent practicable. Mayflower Wind undertook analyses to evaluate the feasibility of alternatives to the Project to ensure these objectives were met.

As described in Sections 4 and 5 of this Analysis, Mayflower Wind's routing analysis, environmental assessment of alternatives and selection of a proposed route (Preferred Route) involved significant efforts to evaluate a wide range of alternatives to achieve the Project objective of connecting the Clean Energy Resource to the regional electric grid. This work included the evaluation of offshore export cable routes, sea-to-shore transition sites, onshore export cable routes, and HVDC converter station sites.

Mayflower Wind eliminated alternatives based on selection criteria including, but not limited to, system operability and reliability, technical and commercial feasibility, constructability, conflicts with existing onshore and offshore utility infrastructure, length of route, onshore traffic congestion, offshore navigational risks, impacts to the natural environment both onshore and offshore, impacts to the human/built environment both onshore and offshore, and overall costs.

The alternatives that Mayflower Wind considered and evaluated, after considering and dismissing the no-action and non-transmission alternatives included: potential POIs; onshore HVDC converter station site options; offshore export cable corridors; offshore export cable design and installation options; offshore export cable landfall site alternatives; onshore export cable route corridors; transmission technologies; and underground cable design options and installation configurations. Some of these alternatives were eliminated based on technical or commercial feasibility assessments, or the inability of the alternative to address the identified interconnection need. Other alternatives that were found to be feasible and capable of addressing the identified need were further examined on the basis of estimated costs, constructability, operability, environmental impact assessments and reliability assessments.

Based on this analysis, Mayflower Wind concluded that the proposed Project would best satisfy the MA EFSB's standards to provide a reliable energy supply for the Commonwealth with a minimum impact on the environment at the lowest possible cost, as set forth in G.L. c. 164, § 69H.

No-Action and Other Non-Transmission Alternatives

Under the no-action alternative, the Project would not be constructed. This alternative would fail to meet the public policy and legislative requirements of the Commonwealth and the region and would not carry out the purpose of the Project, including providing extensive environmental and economic benefits (see Section 1). Therefore, the no-action alternative was dismissed from further consideration.

Given that the Project is being developed to meet specific legislative requirements to increase clean energy supply from offshore wind facilities, other typical non-transmission alternatives such as energy efficiency, load management, large-scale demand response, solar, onshore wind, and combustion-based

generation were also eliminated from further consideration. None of these alternatives would meet the Commonwealth's and the region's need for offshore wind energy. Therefore, the non-transmission alternative was dismissed from further consideration.

3.2 POINT OF INTERCONNECTION ALTERNATIVES

To optimize and deliver the full Clean Energy Resource potential output from the Lease Area, Mayflower Wind assessed the viability of various POIs (see Figure 3-1) within feasible distance of the Clean Energy Resource before selecting the Brayton Point POI.

The analysis of POI alternatives involved an inventory and assessment of the site selection criteria identified below, in efforts to avoid or minimize impacts:

- Acquire adequate physical space to construct the converter station.
- Avoid conflicts with existing overhead and underground utilities.
- Avoid or reduce the number of splice vaults that may need to be installed.
- Reduce socio-economic impact on the general public.
- Minimize impacts to residential areas and the environment.
- Minimize traffic disruption to local roadways during construction.
- Minimal impact to sensitive receptors and facilities.
- Avoid other existing third-party submarine and underground cable systems.

3.2.1 POIs Considered

POIs that Mayflower Wind considered and eventually deselected or dismissed for the Falmouth Connector Project included Bourne, West Barnstable, Falmouth Bulk, Falmouth Tap, Carver, Canal, Pilgrim, Kent County (Rhode Island), Mystic, K Street, and Brayton Point described in detail in Section 4. Although Brayton Point was not carried forward for the Falmouth Connector Project, it remained a desirable POI for this second and separate Mayflower Wind interconnection (i.e., Brayton Point) and, therefore, is discussed below and in Section 4.

3.2.2 Brayton Point POI

Brayton Point is the site of a recently decommissioned fossil fuel (coal/oil) fired 1,600-MW base load power station located on an approximately 300-ac (121-ha) brownfields site on a peninsula of land surrounded by Mount Hope Bay to the south, the Lee River to the west, the Taunton River to the east, and Interstate Route 195 to the north.

The existing Brayton Point 345 kV substation, which served the former Brayton Point Power Station, is owned and operated by National Grid. The substation is connected to the bulk power grid by two 345 kV lines which run north to Medway as well as several 115 kV lines running north, east, south, and west. Brayton Point's existing, robust grid infrastructure and waterfront location make it an ideal interconnection location for offshore wind.

In 2021, Mayflower Wind established ISO-NE interconnection queue positions with a POI at Brayton Point that will be used for development of this separate 1,200 MW connector project to optimize and deliver the full Clean Energy Resource potential output (an estimated 2,400 MW) from the Lease Area. Brayton Point was identified as a feasible POI (considering the use of HVDC transmission technology) during the analysis of potential POIs for the Falmouth connector project. The establishment of a

favorable ISO-NE queue position for the POI at Brayton Point combined with the feasibility of the POI resulted in the determination of Brayton Point as the preferred POI for the Brayton Point Project. The Brayton Point site (Figure 3-1) has been used for decades as a hub for regional energy generation and has a strong 345-kV transmission connection to the regional transmission system. Mayflower Wind's favorable queue position plus the robust transmission network at Brayton Point means reduced cost, time and interconnection difficulties for the Project. Its shorefront location on Mount Hope Bay makes it an ideal location for redevelopment of a brownfield site and an interconnection point for the offshore-generated Clean Energy Resource to inject renewable clean energy into the existing electric grid.

Mayflower Wind selected the Brayton Point POI as the preferred injection point as it offers significant injection capacity and multiple positive attributes for interconnection. The Brayton Point POI meets the site selection criteria listed above, as well as: (i) the existing 345-kV transmission infrastructure will allow for a robust interconnection to the regional transmission system; (ii) the site is a brownfield site at the coast used for decades for the operation of a coal/oil-fired power plant; (iii) it is the shortest and least expensive onshore option; and (iv) Mayflower Wind was able to acquire an established and partly developed interconnection queue position at Brayton Point that will enable Mayflower Wind to interconnect in a quicker and less costly way. Additionally, there is a lack of direct abutters at Brayton Point.

Mayflower Wind will develop a new HVDC converter station to convert the Project's HVDC power to 345-kV HVAC for interconnection with the Brayton Point POI. The HVDC converter station will be located on the central portion of the Brayton Point site immediately north of the location of the two former 500 feet tall concrete cooling towers that were razed in 2017 when the former coal-fired Brayton Point Power Station was decommissioned. The onshore export cables will enter the converter station site from the northwest or from the southeast corner, depending on which onshore export cable route is chosen. From the converter station, the 345-kV HVAC underground transmission lines will exit the converter station and travel south for interconnection at the existing National Grid substation.

3.3 OFFSHORE EXPORT CABLE ROUTING AND LANDFALL SELECTION

Identifying export cable routes requires careful planning and route optimization with considerations including offshore physical hazards, existing submarine cables, economic and recreational use areas, protected marine areas, and the interconnection points. Physical hazards may include shipwrecks, unexploded ordnance, other existing (and planned) 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.

As more fully described in Section 4, Mayflower Wind has identified a single offshore export cable corridor to the Brayton Point landfall. The corridor selection is the product of detailed marine surveys, consultations with the Massachusetts Ocean Team agencies (CZM, Massachusetts Department of Environmental Protection [MassDEP], Massachusetts Board of Underwater Archaeological Resources [MA BUAR], Massachusetts Division of Marine Fisheries (MA DMF), Massachusetts Environmental Policy Act [MEPA] Office), in collaboration with other stakeholders, and input from federal, state, and local resource agencies. Mayflower Wind has also consulted with the Rhode Island Coastal Resources Management Council, the Rhode Island Department of Environmental Management (RIDEM), and the Rhode Island Historical Preservation and Heritage Commission.

Many factors were evaluated when selecting landfall locations. Physical space availability was evaluated primarily for construction and installation such as adequate space to accommodate an onshore HDD staging area. Mayflower Wind assessed land-uses adjacent to potential landfall locations to inventory

and avoid/minimize environmental effects, identify potential for use of existing infrastructure, minimize disturbances to residential areas, avoid protected lands, and avoid effects to historic districts, conservation districts, and businesses that could be impacted including nearby marine uses (i.e., fisheries, shellfish beds, marinas, beaches).

Water depth at the landfall approach was also an important factor because the drafts of the vessels to be used to support the HDD operations need to be considered as well as the effects from sea-state conditions, wave action, and surf zone on the vessels and cable assets. At the Brayton Point HDD punchout ("entry" and "exit") locations, where the offshore export cables will begin the approach to shore, the HDD offshore exit locations are likely to be on the order of 6.6 to 32.8 feet (2.0 to 10.0 m) in depth below mean sea level. The selected landfall location needs to balance avoidance of marine and coastal resources such as submerged aquatic vegetation and coastal wetlands, avoid risk of cable exposure due to wave action and sediment migration, and resolve the complexity of sea-to-shore HDD operations and transitions.

The offshore export cable corridor (ECC) enters Massachusetts state waters southwest of Brayton Point in Mount Hope Bay after traversing through Rhode Island state waters. In Massachusetts waters, the offshore ECC diverges into two alternative approaches and landfall locations.

Mayflower Wind evaluated two distinct approaches to make landfall at Brayton Point and route the onshore export cables to the HVDC converter station. These two export cable routes at Brayton Point have some measure of geographic diversity, with the western landfall approach from the Lee River, and the eastern landfall approach from the Taunton River (refer to Figure 3-2). The offshore export cables will make landfall using HDD to eliminate or reduce impacts to the shoreline environments and nearshore areas of the Massachusetts coast. Both landfall locations at Brayton Point are previously disturbed areas generally consisting of an armored bank on the Lee River side and a vertical bulkhead on the Taunton River side, and the general land use consists of roads and former marine and power station industrial uses.

A summary of the route alternatives evaluated by Mayflower Wind is presented below in Table 3-1 and the universe of routes assessed by Mayflower Wind is shown in Figure 3-3. The route selection methodology presented in Section 4 further explains the steps Mayflower Wind took to refine and select a Preferred Route and Noticed Alternative Route.

3.3.1 Lee River (Western Approach)

The Preferred Route for the offshore export cables proceeds northeast for approximately 2.1 mi (3.4 km) through Mount Hope Bay, entering the mouth of the Lee River on the western side of Brayton Point (Figure 3-2). This route avoids the main shipping channel in Mount Hope Bay and the shipping channel and turning basin located at the mouth of the Taunton River.

At the termination of the offshore export cable route in the mouth of Lee River west of Brayton Point, HDD will be used at the sea-to-shore transition from offshore to onshore export cables southwest of the proposed onshore HVDC converter station. From the onshore HDD transition location, the cable will be routed as underground HVDC cable alongside an existing gravel access road for approximately 0.6 mile (1.0 km) to the proposed HVDC converter station.

There are no known existing submarine cables that make landfall at the west side of Brayton Point and there are no potential impacts to abutting property owners along the western shoreline or other infrastructure, with the onshore transition being made within a developed area formerly used for power station operations.

3.3.2 Taunton River (Eastern Approach)

The Noticed Alternative Route proceeds northeast for approximately 2.4 mi (3.9 km) through Mount Hope Bay, entering the mouth of the Taunton River on the eastern side of Brayton Point in Somerset, near the Fall River municipal line.

The Taunton River landfall is located approximately 0.3 mi (0.6 km) to the southeast of the Lee River landfall on the opposite side of the Brayton Point peninsula (Figure 3-2). From the onshore HDD transition location, the cables would be routed alongside Brayton Point Road, across the existing National Grid easement, and alongside existing access roads for approximately 0.4 mi (0.7 km) to the proposed HVDC converter station. An existing parking area on the south side of Brayton Point Road could be used for construction staging operations.

This landfall would require the use of Brayton Point Road for the export cables, which could have an impact on business operations associated with the Brayton Point Commerce Center (the Commerce Center). The Commerce Center also utilizes an area along the shore of the peninsula south of the proposed HDD transition location. Equipment staging and set-up for the sea-to-shore transition would potentially interfere with boat traffic and operations at the Commerce Center. The sea-to-shore transition equipment and staging operations would also be located immediately south and offshore from Brayton Point Beach and residential properties which would likely have greater visual and noise impacts during construction compared to work conducted on the west side of the peninsula. There are no known existing submarine cables that make landfall at the east side of Brayton Point. The Fall River Harbor Project (main shipping channel) is located within the Taunton River. The main shipping channel has a 35 ft (11 m) dredge depth. Were a cable to be installed within or across the channel, the USACE would require that the cable be buried at a minimum depth of 10 ft (3.0 m) below the dredge depth of the channel. There is also an active privately maintained 34 ft (10 m) wide dredged shipping channel and associated 50 ft (15.2 m) wide turning basin in the Taunton River that provides large vessel access to the eastern approach to Brayton Point.

TABLE 3-1. OFFSHORE AND ONSHORE EXPORT CABLE ROUTES CONSIDERED [a]

Route Category	Route ID	Route Description	1st Intermediate Landfall	2nd Intermediate Landfall	Brayton Point Landfall	Length in miles (km)							
						Offshore				Onshore			Total
						Federal waters [b]	RI state waters	MA state waters	Total	RI jurisdiction	MA jurisdiction	Total	
Sakonnet River with intermediate onshore crossing of Portsmouth	1	Sakonnet River to Boyds Ln. to RWU	Boyds Ln. (Portsmouth, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	20.9 (33.7)	2.1 (3.4)	**113.2 (182.1)**	1.0 (1.6)	0.6 (0.9)	**1.5 (2.4)**	**114.7 (184.5)**
	2	Sakonnet River to Boyds Ln. to Montaup Country Club	Boyds Ln. (Portsmouth, RI)	Montaup Country Club (Portsmouth, RI)	Lee River	90.1 (145.0)	20.6 (33.2)	2.1 (3.4)	**112.9 (181.6)**	1.7 (2.7)	0.6 (0.9)	**2.2 (3.6)**	**115.1 (185.2)**
	3	Sakonnet River to Boyds Ln. to RIDEM/ Aquidneck Land Trust	Boyds Ln. (Portsmouth, RI)	DEM/Aquidneck Land Trust (Portsmouth, RI)	Lee River	90.1 (145.0)	20.8 (33.5)	2.1 (3.4)	**113.0 (181.9)**	1.0 (1.7)	0.6 (0.9)	**1.6 (2.6)**	**114.6 (184.5)**
	4	Sakonnet River to Boyds Ln. to Mt. Hope Bridge	Boyds Ln. (Portsmouth, RI)	Mt. Hope Bridge (Portsmouth, RI)	Lee River	90.1 (145.0)	21.2 (34.0)	2.1 (3.4)	**113.4 (182.5)**	1.2 (2)	0.6 (0.9)	**1.8 (2.9)**	**115.2 (185.3)**
	5	Sakonnet River to Boyds Ln. to RWU	Boyds Ln. (Portsmouth, RI)	RWU (Portsmouth, RI)	Taunton River	90.1 (145.0)	20.9 (33.7)	2.4 (3.9)	**113.5 (182.6)**	1.0 (1.6)	0.4 (0.7)	**1.4 (2.3)**	**114.9 (184.8)**
Offshore routes to Brayton Point	6	Sakonnet River north	--	--	Lee River	90.1 (145.0)	20.7 (33.3)	2.4 (3.9)	**113.2 (182.2)**	0	0.6 (0.9)	**0.6 (0.9)**	**113.8 (183.1)**
	7	Narragansett Bay East Passage	--	--	Lee River	90.4 (145.4)	30.4 (48.9)	2.1 (3.4)	**122.9 (197.7)**	0	0.6 (0.9)	**0.6 (0.9)**	**123.4 (198.6)**
	8	Narragansett Bay West Passage	--	--	Lee River	90.4 (145.4)	41.9 (67.4)	2.1 (3.4)	**134.4 (216.2)**	0	0.6 (0.9)	**0.6 (0.9)**	**134.9 (217.1)**
Routes with intermediate RI onshore crossing bypassing the Sakonnet River	9	Second Beach, Paradise Ave., & Rte. 138 to RWU	Second Beach (Middletown, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	11.8 (18.9)	2.1 (3.4)	**104.0 (167.3)**	11.0 (17.7)	0.6 (0.9)	**11.6 (18.6)**	**115.6 (185.9)**
	10	Second Beach, Paradise Ave., & Rte. 138 to Mt. Hope Bridge	Second Beach (Middletown, RI)	Mt. Hope Bridge (Portsmouth, RI)	Lee River	90.1 (145.0)	12.0 (19.3)	2.1 (3.4)	**104.2 (167.7)**	10.9 (17.6)	0.6 (0.9)	**11.5 (18.5)**	**115.7 (186.2)**
	11	Second Beach, Mitchell's Ln., & Rte. 138 to RWU	Second Beach (Middletown, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	11.8 (18.9)	2.1 (3.4)	**104.0 (167.3)**	11 (17.7)	0.6 (0.9)	**11.5 (18.5)**	**115.5 (185.9)**
	12	Rte. 77, Rte. 177, Fish Rd., & Souza Rd. to Schooner Dr.	Breakwater Point (Little Compton, RI)	Schooner Dr. (Tiverton, RI)	Lee River	90.1 (145.0)	8.7 (14.1)	2.4 (3.9)	**101.3 (163)**	15.8 (25.4)	0.6 (0.9)	**16.3 (26.3)**	**117.6 (189.3)**
	13	South Shore Beach, Rte. 81, Rte. 177, Fish Rd., & Souza Rd. to Schooner Dr.	South Shore Beach (Little Compton, RI)	Schooner Dr. (Tiverton, RI)	Lee River	86.1 (138.5)	2.7 (4.4)	7.1 (11.4)	**95.9 (154.3)**	16.3 (26.3)	0.6 (0.9)	**16.9 (27.2)**	**112.8 (181.5)**
Massachusetts-only route	14	Horseneck Beach, Rte. 88, Rte. 6, Brayton Ave., & S. Main St. to Ferry St.	Horseneck Beach (Westport, MA)	Ferry St. (Fall River, MA)	Taunton River	83.8 (134.8)	0	7.6 (12.3)	**91.4 (147.1)**	0	17.3 (27.9)	**17.3 (27.9)**	**108.7 (174.9)**

Notes: Abbreviations are defined on the Abbreviation Table at the beginning of this document. Numbers may not compute precisely due to rounding.

[a] *This table summarizes 14 export cable routes considered, many of which were down selected. The list captures a representative array of route segment combinations considered by Mayflower Wind.*

[b] *Offshore export cable route length in federal waters is subject to adjustment based on selection of final OSP location(s) from the defined WTG/OSP positions in the Lease Area in federal waters. This will not impact the cable route lengths in RI state waters or MA state waters or any route comparisons presented here.*

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3.4 ONSHORE EXPORT CABLE ROUTING

The evaluation of onshore export cable routes is directly linked to the alignments of the offshore export cable route, the landfall location, and the POI. The onshore export cables extend from the onshore HDD TJBs underground to the onshore HVDC converter station.

3.4.1 Rhode Island Onshore Export Cable Routes

Mayflower Wind performed a routing analysis to determine the best route to connect the Clean Energy Resource to the Brayton Point POI. Longer onshore crossings of Rhode Island through Middletown, Portsmouth, Little Compton and Tiverton, and longer offshore routes through the East Passage and West Passage of Narragansett Bay and through the northern passage of the Sakonnet River in Portsmouth, Rhode Island, with no intermediate crossing were carefully considered, as illustrated on Figure 3-3 Universe of Considered Routes. Table 3-1 above summarizes the onshore export cable route alternatives evaluated by Mayflower Wind.

3.4.2 Massachusetts Onshore Export Cable Route

Mayflower Wind evaluated an ECC through Buzzards Bay in Massachusetts for a distance of approximately 7.6 mi (12.3 km), with a landfall at Horseneck Beach and an onshore export cable route through Westport and Fall River, Massachusetts. Overall, Buzzards Bay is a net depositional area[2]; local areas of higher tidal current energy, however, result in some areas of sand and gravel. Fine-grained sediments occur throughout the deeper basins and troughs where the bottom sediments will tend to shift, while sands are found in the shallow, higher kinetic energy sites.[3,4] Buzzards Bay provides spawning habitat fisheries. The marine resources and shifting bottom types made this offshore route less desirable. Contributing to the flaws of this route is the landfall at the Horseneck Beach State Reservation and barrier beach system, which do not offer a suitable location for an onshore HDD staging area. The ECC would diverge from the ECC in federal waters into Massachusetts state waters and continue northerly in Buzzards Bay to an HDD transition located off Horseneck Beach in Westport, Massachusetts.

The Westport onshore route alternative would commence with the offshore export cables making landfall at the Horseneck Beach parking lot in Westport via HDD. There are several restrictions to landing the export cables at the Horseneck Beach parking lot. Horseneck Beach is a barrier beach constricted to the north and south by coastal wetland resources that are to be avoided during cable installation. Although the parking lot would serve as an adequate HDD staging area, there is a lack of available space for all of the HDD activities specifically the process of fusing the conduit prior to installation, unless the conduit were temporarily strung on Horseneck Beach or strung along the side of John Reed Road, neither of which are preferred by Mayflower Wind.

Once the export cables made landfall, the onshore export cables would continue underground onto John Reed Road, heading northwest onto Route 88 crossing the Norman Edward Fontaine Bridge over Horseneck Channel. The areas bordering Horseneck Channel consist of salt marsh with some perimeter bordering vegetated wetlands and forested land alongside Route 88 before transitioning to predominantly dense residential development.

The Norman Edward Fontaine Bridge is a bascule bridge (also referred to as a drawbridge or a lifting bridge). The bridge, whose channel spans 75 ft (23 m), crosses the East Branch of the Westport River.

[2] CDM 1990
[3] Moore 1963
[4] Howes and Goehringer 1996

Two preliminary installation methods considered for the cables to cross the East Branch of the Westport River and continue north on Route 88 include: 1) suspend the cable from the bridge using a bridge hanger system within a utility cavity; and 2) an HDD beneath the river channel. Suspending the cables system to a bascule bridge is a fatal flaw and would instead require trenchless technology such as an HDD to cross under the river to exit the Horseneck Beach State Reservation.[5] HDD is infeasible because there is no suitable place to land the cables north of the East Branch of the Westport River crossing without impacting regulated wetlands.

Once on Route 88, the onshore export cable route would head north along Route 88 for approximately 12 mi (19 km) through Westport to the intersection with State Route 6. From Westport, Route 88 is a two-lane highway that eventually turns into four lanes as it approaches State Route 6. Large mature trees hang over the highway, and there would be a potential need for tree trimming or tree removal along the highway to accommodate construction. The onshore export cable route would then head in a westerly direction following State Route 6 for 1.2 mi (1.9 km) into the City of Fall River, where it would continue for 0.6 mile (1.0 km) to Brayton Avenue. At approximately 0.5 mile (0.8 km), the route would either continue along the southern shoulder of State Route 6 or diverge onto the rails-to-trails bike path located along the northern border of South Watuppa Pond. The route would then merge onto Brayton Avenue in Fall River and continue west for approximately 1.5 mi (2.4 km). There are on- and off-ramps for State Route 24 located along Brayton Avenue, with high volumes of traffic that would require significant traffic management planning. The route would then head in a northwesterly direction following a network of Fall River municipal roadways including 0.3 mi (0.5 km) along Stafford Road, approximately 0.1 mi (0.2 km) along Plymouth Avenue, approximately 0.2 mi (0.3 km) along Second Street, approximately 0.3 mi (0.5 km) along Middle Street, 0.1 mi (0.2 km) along South Main Street, continue for 0.3 mi (0.5 km) following Bradford Avenue, merge onto Almond Street for 0.2 mi (0.3 km), and then ending at the Ferry Street parcel located one street crossing from the Taunton River.

Limiting the onshore routing to a minimal distance is preferred, as underground construction within public roadways can be disruptive and underground construction and materials are very costly. Extensive traffic management plans would be required along the 17 mi (27 km) onshore roadway route to redirect traffic from the busy highways and the residential and commercial driveways. This 17 mi (27 km) onshore alternative would incur substantial additional cost to the Project and is viewed by Mayflower Wind as cost prohibitive.

The potential intermediate site for the onshore export cable would be located at the intersection of Almond Street and Ferry Street (refer to Figure 3-5). This segment of the route would require routing through densely populated city neighborhoods identified as environmental justice populations (Figure 3-5). This segment also passes by other sensitive receptors including Saint Anne's Hospital, St. Anne's Shrine and a large recreational field at Kennedy Park, among others. The Ferry Street parcel would ultimately connect to the Brayton Point POI and could serve as either an alternative location for the proposed HVDC converter station before interconnecting with Brayton Point or could serve as a potential HDD staging area to cross the Taunton River to make landfall at Brayton Point. The cables would need to pass from Fall River to Brayton Point via submarine cabling across the mouth of the Taunton River south of the Interstate Route 195 Braga Bridge. Routing north and east to transition to Braga Bridge (MassDOT, dense population, bridge loading, lack of adequate space underneath the bridge, etc.). Braga Bridge crossing is not technically feasible.[6] Mayflower Wind determined that

[5] According to the MassDOT Utility Accommodation Policy on State Highway Right of Way states, high voltage electric power transmission line installations on bridge structures shall generally not be permitted except in extraordinary circumstances. Link Volume (mass.gov).
[6] According to the MassDOT Utility Accommodation Policy on State Highway ROW states, high-voltage electric power transmission line installations on bridge structures shall generally not be permitted except in extraordinary circumstances. Link Volume (mass.gov).

installing the cable system on the underside of the Braga Bridge to cross the Taunton River was infeasible.

The submarine route under the Taunton River, crossing a federal shipping/navigation channel and extending a distance approximately 1.3 mi (2.1 km), which would likely overextend the length for a single continuous HDD. This would result in Mayflower Wind implementing supplementary offshore cable installation techniques to bury the remainder of the export cable within the Taunton River, which would result in cable installation disturbance to the riverbed of the Taunton River.

This route alternative was later dismissed due to a variety of engineering, construction, environmental, and other stakeholder concerns. The Brayton Point POI was selected for the Project due to its robust capacity for energy injection into the existing electrical grid and the opportunity to redevelop the previously disturbed area of the former coal-fired power station property. Mayflower Wind then selected the proposed route for the Project, north up the Sakonnet River, making intermediate landfall underground across Aquidneck Island in Rhode Island, to Mount Hope Bay, then northwest up the Lee River and into Brayton Point, because it is a technically and commercially feasible route that would avoid or minimize impacts relative to other routes considered to reach the POI and deliver energy to the regional transmission system.

3.5 HVDC Converter Station Site Alternatives

Two sites were considered for the proposed HVDC converter station. The converter station is a specialized electrical substation designed to convert direct current (DC) to alternating current (AC) to enable interconnection to the existing transmission infrastructure. The preferred location is at Brayton Point approximately 0.2 mi (0.3 km) north of the POI at the existing 345-kV Brayton Point substation. Mayflower Wind considered another location for a converter station in Fall River, Massachusetts at the intersection of Almond and Ferry Streets (Figure 3-4).

3.5.1 Brayton Point, Somerset

Brayton Point is the site of a recently decommissioned fossil fuel (coal/oil) fired 1,600-MW base load power station located on an approximately 300-ac (121-ha) brownfields site on a peninsula of land surrounded by Mount Hope Bay to the south, the Lee River to the west, the Taunton River to the east, and Interstate Route 195 to the north (see Figure 1-2).

Mayflower Wind is proposing to construct a new HVDC converter on the central portion of the Brayton Point site located immediately north of the two 500-ft tall concrete cooling towers that were razed in 2017 after the former Brayton Point Power Station was decommissioned. The proposed site is located on previously developed lands zoned as an industrial district by the Town of Somerset. The onshore export cables will enter the converter station site from the northwest or from the southeast corner, depending on which onshore export cable route is chosen. A preliminary layout of the proposed HVDC converter station, including a grading plan and storm water plan, are found in Attachment B.

3.5.2 Ferry Street Parcel, Fall River

Mayflower Wind evaluated a second option for siting the HVDC converter station on an industrial parcel located off Ferry Street in Fall River, Massachusetts (refer to Figure 3-4).

Mayflower Wind considered an 8.28-acre parcel located at the corner of Ferry and Almond Streets, south of the Braga Bridge crossing of the Taunton River. If an HVDC converter station were to be constructed at this site, interconnecting with the POI at Brayton Point would require the need for HVAC cabling across the Taunton River. The Ferry Street parcel is located within an area zoned as industrial by

the City of Fall River, which is located within a dense industrial/commercial/residential area and an environmental justice population. Residential development is located to the south of the site, on the opposite side of the rail corridor. Other land-use constraints include a riverfront private marina on the Taunton River and the close proximity of the Borden Flats Light Station (National Register of Historic Places), both of which are located to the west of the site.

Mayflower Wind deselected the Ferry Street site, as the proposed converter site is located immediately adjacent to the Brayton Point POI, and construction is expected to result in substantially less socio-economic and land use impacts.

3.6 ONSHORE HVAC TRANSMISSION LINE ROUTE

At Brayton Point, underground 345 kV HVAC transmission lines will be installed to transmit the converted power from the HVDC converter station to the POI at the existing National Grid Brayton Point 345 kV substation, approximately 0.2 mi (0.3 km) south of the proposed HVDC converter station. Previously paved or gravel roadways and parking areas located on the former power station property will be used for construction staging operations, together with the converter station site.

The underground transmission lines will be housed within a concrete duct bank similar to the onshore export cable. The cables will interconnect to a breaker at the POI via standard steel work outside the National Grid Brayton Point substation building, as well as connection of communication/fiber cables and associated substation equipment.

The interconnecting transmission owner (National Grid) would be responsible for any upgrades or modifications to the existing 345-kV substation at Brayton Point serving as the onshore POI. The substation previously served the retired Brayton Point Power Station, making it a robust grid connection point. To interconnect the Project, Mayflower Wind anticipates that the suite of upgrades will include an expansion of the National Grid substation building to accommodate an additional breaker bay position, upgrades to two 115-kV transmission lines, and minor pole relocation on an existing 345-kV line segment at Brayton Point. Impacts related to the construction of the National Grid enabling transmission upgrades are not included in this Analysis, because the siting of such upgrades and any related impacts are the responsibility of the interconnecting transmission owner.

3.7 TRANSMISSION TECHNOLOGIES

Mayflower Wind considered two electric power transmission technologies for the proposed Project, HVAC and HVDC. These technologies were evaluated in terms of their practical aspects as well as reliability, cost, and/or potential environmental impact as described below. The choice between HVAC or HVDC technology for the export system is highly project specific.

For the reasons explained below, Mayflower Wind determined that HVDC is the more appropriate technology for use for this Project, as it is better suited to the relatively moderate to long length of the export cables to shore.[7]

3.7.1 Export Cable Technology Alternatives

Submarine and land HVAC and HVDC cables have been in use for decades. Both HVAC and HVDC cable capacities have increased over time. As evidenced by their wide use, submarine and land cables are

[7] *Offshore Wind Transmission Study Comparison of Options*, NJ Board of Public Utilities, pp. 71 - 73 (Dec. 29, 2020); https://www.nj.gov/bpu/pdf/publicnotice/Transmission%20Study%20Report%2029Dec2020%202nd%20FINAL.pdf

considered reliable and are widely used for transmitting energy to remote loads, ensuring reliability across bodies of water, and delivering power to or from offshore locations.

3.7.2 HVAC Transmission Technology

HVAC transmission technology uses alternating current waveform for bulk transmission of power. An HVAC system for offshore wind transmission requires a transformation of voltage at the offshore end of the export cable circuits. The offshore substation platforms in the Lease Area would step up the voltage from the WTG array to a higher nominal export cable voltage, up to approximately 345 kV, which is more suitable for long distance transmission.

3.7.3 HVDC Transmission Technology

HVDC uses direct current waveform for the bulk transmission of power. The most common HVDC technology employed for offshore wind export systems is Voltage Source Converter modularmultilevel converter technology, which is proposed by Mayflower Wind for the Project.

HVDC systems require converters at each end of the HVDC transmission circuit. An offshore converter station will be located on a platform within the Lease Area. The offshore converter station collects the power from the WTGs and converts it to direct current for transmission to shore. The onshore converter station converts from HVDC to 345-kV HVAC for injection to the existing ISO-NE administered regional transmission system.

The purpose of the converter station is to collect the direct current power from the WTGs and transform it to alternating current for transmission to the POI with the regional transmission system.
To deliver power from the Clean Energy Resource to Brayton Point, HVDC is the preferred transmission technology for the export power cable system. HVDC is being used for long-distance power transmission in overseas markets and has been proposed for some long-distance projects in the Northeast. HVDC technology offers several advantages over HVAC for this Project. For example, (i) HVDC allows more efficient bulk power transfer over long distances, (ii) HVDC can expand the energy network making it more stable, with lower power losses, and (iii) HVDC allows for an increase in system reliability, by preventing cascading failures from propagating from one part of a wider power transmission grid to another.

3.7.4 Export Cable Transmission Technology Voltage

Under an HVDC transmission scenario, a nominal system operating voltage of +/- 320 kV would be utilized. The cables would be installed in a bundled configuration where practicable, or individually installed, if required. Unlike HVAC technology, the voltage of each cable maintains constant polarity and the direction of the current is constant.

Higher voltages would not significantly change the size of the export cable or result in material reductions in the area of potential impact to the seafloor associated with installation. Voltages lower than the proposed +/- 320 kV HVDC would require more cables to be placed along the seafloor, which would enlarge the impact area in the offshore environment and may increase the overall energy loss through transmission.

3.7.5 Cable Type

Cross-linked polyethylene (XLPE) insulation would be used for the Project's offshore and onshore cables. This cable type is considered state-of-the-art technology for offshore transmission worldwide. XLPE

cables have proven to be more reliable with greater ease of handling than high-pressure fluid filled and oil impregnated cables. XLPE also allows for standard and quicker jointing and termination.

3.8 CONCLUSION

Mayflower Wind evaluated a no-action and other non-transmission alternatives; however, none of these alternatives meet the purpose and need of the Project to deliver renewable clean energy from offshore wind to the Commonwealth, and thereby advance the public policy requirements of Massachusetts and the region. The no-action and non-transmission alternatives would not allow for the interconnection of the Clean Energy Resource to the existing electric grid and therefore do not meet the Commonwealth's and the region's need for the Project, consistent with public policy requirements, as described in Sections 2 and 6 of this Analysis.

Mayflower Wind evaluated POI, offshore and onshore export cables routes, landfalls, converter station sites and onshore transmission routing alternatives. Mayflower Wind undertook a thorough route selection process addressing the Siting Board's standards applicable to jurisdictional energy facilities. Mayflower Wind identified and evaluated various POIs, routes and installation techniques as potential alternatives to satisfy the Project need and objective to provide renewable clean energy from the Clean Energy Resource. The Preferred Route would enable Mayflower Wind to achieve the best balance between lowest reasonable cost, avoiding or minimizing impacts to the environment, and offering a great degree of reliability, in accordance with the Siting Board's standards and precedent.

Mayflower Wind also evaluated transmission technology alternatives for the Project and, for the reasons stated above, determined that HVDC rather than HVAC will be the best option for this Project.

As a result of this alternatives analysis, proposed transmission infrastructure and onshore routing was advanced to a more refined routing analysis presented in Section 4, including a comparative analysis of the routes and the selection of the Preferred Route and the Noticed Alternative, together with a variation of them (Noticed Variation) at Brayton Point. A more detailed comparison of the Preferred Route and the Noticed Alternative Route and related avoidance or minimization of impacts is presented in Section 5.

4 ROUTE SELECTION

As discussed in Sections 2 and 3, Mayflower Wind proposes to address the identified need by constructing the Project to deliver approximately 1,200 MW of renewable clean energy from Mayflower Wind's offshore wind Clean Energy Resource in federal waters on the OCS. For purposes of this Analysis, the "Project" includes all Massachusetts state-jurisdictional elements, including: the offshore export cables in Massachusetts state waters, the onshore facilities for the sea-to-shore transition, the onshore export cables, the onshore HVDC converter station, and the underground 345-kV HVAC transmission facilities that lead to a POI at Brayton Point in the Town of Somerset for the Preferred Route or Noticed Alternative Route, together with any other ancillary structures which are an integral part of the operation of these transmission facilities.

Mayflower Wind developed the routing analysis with the objective of identifying a design capable of delivering energy from approximately 1,200 MW of capacity from the Clean Energy Resource to a suitable onshore landfall location and POI that was feasible and cost-effective and more likely to avoid or minimize impacts. The routing analysis identified the proposed route ("Preferred Route") for the Project as the option that best balances: (i) minimization of impacts including impacts to the developed and natural environment, (ii) engineering considerations, (iii) constructability, (iv) reliability, and (v) cost. The route selection process was also highly dependent on the ISO-NE queue position attained by Mayflower Wind, which allowed use of the POI at Brayton Point connecting to the existing 345 kV gas insulated switchgear (GIS) substation operated by National Grid.

As described in Section 4.5, based on the results of the routing analysis, Mayflower Wind selected Candidate Route 1 (described in Section 4.3), as the Preferred Route. The Preferred Route enters Massachusetts state waters southwest of Brayton Point in Mount Hope Bay. From here the Preferred Route travels northeast entering the mouth of the Lee River on the west side of Brayton Point (Figure 3-2). At the termination of the offshore export cables west of Brayton Point, the sea-to-shore transition will utilize HDD technology to connect into onshore export cables southwest of the proposed onshore HVDC converter station.

Candidate Route 2 was selected as the proposed alternative route ("Noticed Alternative Route") based on the results of the routing analysis (see Section 4.5), including route scoring. The Noticed Alternative Route, which is described in Section 4.3. in greater detail, also begins where the offshore export cables enter Massachusetts state waters in Mount Hope Bay southwest of Brayton Point. Once within Massachusetts state waters, the Noticed Alternative Route diverges from the Preferred Route travelling northeast and entering the mouth of the Taunton River on the east side of Brayton Point (Figure 3-2). At the termination of the offshore export cables east of Brayton Point, the sea-to-shore transition for the Noticed Alternative Route will utilize HDD technology to connect into onshore export cables southeast of the proposed onshore HVDC converter station. The onshore export cables will transition from the HDD to the HVDC converter station.

From the converter station, the underground 345-kV HVAC transmission lines will then carry the converted power into the POI at the existing 345-kV Brayton Point substation, approximately 0.2 mi (0.3 km) south of the proposed converter station.

This section describes the process Mayflower Wind used to identify and evaluate candidate routes and the selection of the Preferred Route for the Project, as well as the Noticed Alternative Route with some measure of geographic diversity between them. This Section also discusses Mayflower Wind's evaluation of various designs considered. The design considerations ultimately resulted in the identification of the POI, landfall locations, and the selection of Preferred and Noticed Alternative Routes for the Project.

This section also describes Mayflower Wind's evaluation of a design variation considered, resulting in the identification of a Noticed Variation for the Project.

4.1 Overview of Route Selection Process

The following guiding principles were utilized while conducting the routing analysis:

- Comply with all applicable statutory requirements, regulations, and state and federal siting agency policies;
- Develop a reliable, operable, and cost-effective clean energy solution;
- Strive to use established linear corridors (e.g., utility right-of-way [ROW], roadway layouts) to the extent reasonable, practical, and feasible;
- Avoid/minimize the need to obtain additional properties or acquire property rights;
- Prefer direct routes over circuitous routes;
- Minimize Project costs through the avoidance of routes requiring complex/expensive engineering and construction;
- Avoid existing utility infrastructure that would make installation of the Project facilities infeasible;
- Consider and seek to mitigate for impacts to environmental justice populations; and
- Incorporate a balanced approach to avoid/mitigate for environmental and public impacts.

The route selection and design process included the following steps:

- Identify potential suitable POIs with electric grid capacity;
- Use POI as determined by current ISO-NE queue position and availability;
- Identify potential land parcels capable of HVDC converter station development;
- Identify potential landfall locations capable of providing suitable area for HDD installation and new transition vaults (also referred to as TJBs);
- Identify a geographic Study Area that incorporates the POI, proposed HVDC converter station location, proposed landfall location, and adjacent offshore areas in state waters;
- Assess potential routing options within the identified geographic area that would connect landfall, HVDC converter station, and a suitable POI;
- Evaluate each routing option for fatal flaws and only move forward with feasible options;
- Evaluate compiled scoring of each candidate route based on environmental impact, engineering, constructability, permitting, reliability, and cost criteria; and
- Conduct a comparative route analysis with scoring based on these considerations.
- "Right-size" certain facilities where appropriate to prudently and efficiently anticipate future need and avoid unnecessary future impacts.

4.2 Project Study Area

Early in its Project development planning, Mayflower Wind began the route selection process by delineating a study area that encompassed possible routes for offshore and onshore export cables between the Clean Energy Resource (in BOEM Lease Area OCS-A 0521) and several potential POIs (Study

Area). Using the guiding principles above, Mayflower Wind considered all reasonable options within the Study Area and focused the evaluation on potential routes to southeastern Massachusetts.

Important features within the Study Area included:

- Locations of potential landfall sites and possible POIs to the electrical grid;
- Existing transmission infrastructure and its ability to accommodate approximately 1,200 MW for the Project; and
- Locations of existing and planned submarine cables.

4.3 INITIAL ROUTE CONCEPTS

Mayflower Wind evaluated initial route concepts to identify candidate routes that would be carried forward for further analysis, including route scoring. A first step in the selection of viable routes was to assess the "universe" of routes identified in Section 4.2 and perform an initial screening to eliminate routes with excessive length or where potential interconnection points lacked sufficient capacity to accommodate the Project (see Section 4.3.1). The remaining sections explain this process and identify routes carried forward to scoring as "candidate routes".

Mayflower Wind considered offshore routing options for the offshore export cables through Buzzards Bay, Nantucket Sound, Cape Cod Bay, and Narragansett Bay, and encompassed landfall locations ranging from municipal beach parking lots to unimproved ways and other developed and undeveloped areas to connect to the various POIs under consideration. As depicted on Figure 1-4, Mayflower Wind's Lease Area is located approximately 26 nm (37 km) south of Martha's Vineyard, 20 nm (37 km) south of Nantucket, and 51 nm (94 km) southeast from the Rhode Island coast. Mayflower Wind's evaluation of offshore routing included export cable corridors (ECCs) entirely located in offshore or nearshore waters, while other route options involved an intermediate onshore landfall either in Massachusetts or Rhode Island to connect to the alternative POIs. Figure 3-3 presents the Universe of Routes evaluated by Mayflower Wind to connect the offshore lease area on the OCS with the POI at Brayton Point. The export cable route alternatives, offshore and onshore, evaluated by Mayflower Wind were summarized in Table 3-1, and include routes considered in Massachusetts and Rhode Island.

The potential onshore export cable routes encompassed several possible interconnections at substations located in southeastern Massachusetts and Rhode Island (Figure 3-1). Mayflower Wind broadly considered several potential POIs and routes (Table 4-1). Interconnection at the various POIs could be accomplished by various offshore export cable routes, multiple landfall locations, onshore export cable routes, etc. The distances reported in Table 4-1 do not consider such specifics.

TABLE 4-1. UNIVERSE OF POINTS OF INTERCONNECTION CONSIDERED (ALL LENGTHS APPROXIMATE)

Route #	Interconnection Point	Cable Route Length - mi (km)		
		Offshore	Landfall to POI	Total
1	Brayton Point	113 (182)	0.8 (1.3)	114 (183)
2	Kent County Substation, RI	106 (170)	2.5 (4.0)	109 (174)
3	Canal/Carver/Pilgrim	163 (262)	3.0 (4.9)	166 (267)
4	Mystic	224 (360)	6.0 (9.7)	230 (370)
5	K Street	231 (372)	0.8 (1.3)	232 (373)

4.3.1 Export Cable Route Length and Transmission Technology

Mayflower Wind evaluated and screened a wide range of routing options identified in Section 4.2 in several steps.

As discussed in Section 3.1.2.4, Mayflower Wind considered two electric power transmission technologies for the proposed Project, HVAC and HVDC. Marine HVAC and HVDC cables have been in use for decades. Both HVAC and HVDC cable capacities have increased over time. As evidenced by their wide use, marine cables are reliable and are widely used for transmitting energy to remote loads, ensuring reliability across bodies of water, and delivering power to or from offshore locations. HVDC is the preferred technology for the proposed landfall at Brayton Point due to the required length of cable.

Under an HVDC transmission scenario, a nominal system operating voltage of +/- 320 kV would be utilized. The system would require two single-core power cables and associated communications cabling. The cables would be bundled where practicable, or individually installed if required. Unlike HVAC technology, the voltage of each cable maintains constant polarity and the direction of the current is constant.

An HVDC system requires converters at each end of the HVDC transmission circuit. A converter station would be located on the offshore substation platforms (OSPs) within the Lease Area. The converter station collects the power from the WTGs and converts it from AC to HVDC for transmission to shore. Onshore, the HVDC transmission is converted to 345-kV HVAC for injection to the existing ISO-NE electrical grid. The onshore converter station will be located at Brayton Point.

4.3.2 Potential POI

When fully built out, and with continuing advancements in wind technology, Mayflower Wind's Clean Energy Resource will supply an estimated 2,400 MW of offshore wind energy, enough to power nearly a million homes. Delivery of this amount of clean power will necessitate multiple POIs, for several reasons, most notably that individual connections to ISO-NE are limited to 1,200 MW maximum.

Mayflower Wind has assessed multiple POIs for the interconnection of the Project. Mayflower Wind considered multiple coastal interconnection points with suitable electrical characteristics, accessibility, as well as the potential for nearby land for the required substation/converter station facilities. Mayflower Wind has invested considerable effort and funds into maturing several key POIs on Cape Cod and importantly made an investment in the Brayton Point POI as a secure and mature asset with ample injection capacity. This action was driven by the regional transmission system constraints to deliver energy from Cape Cod to New England load centers, including the Boston area. The need for transmission infrastructure to enable delivery from remote geographic renewable energy development zones, such as the offshore wind Lease Area, remains a significant topic in transmission planning and transition to a renewable clean energy grid. Key attributes of several of the POIs Mayflower Wind considered are summarized in this section.

Bourne

Mayflower Wind evaluated the construction of a new 345-kV interconnection switching station in the vicinity of the Eversource 115-kV Bourne switching station southeast of the Cape Cod Canal. ISO-NE has since indicated that the planned Eversource Cape Cod upgrades in this area would include a POI to the south at the Eversource Falmouth Tap substation, which is closer to the coast and a shorter distance to the Clean Energy Resource. Therefore, Bourne was deemed not feasible.

West Barnstable

In 2019, Mayflower Wind conducted a high-level assessment of a POI at the Eversource West Barnstable substation located in Hyannis, Massachusetts. As this POI already has two connections planned, it was considered not feasible.

Falmouth Bulk

Mayflower Wind evaluated a POI at the Falmouth Bulk substation in consultation with Eversource. The two 115-kV circuits at Falmouth Bulk substation are limited in capacity (less than 400 MW). Therefore, to meet the ISO-NE interconnection criteria, a POI at Falmouth Bulk would necessitate significant upgrades and thus was not considered feasible.

Falmouth Tap

ISO-NE determined that the POI for the Mayflower Wind Falmouth Connector Project would be in the Falmouth Tap substation area. The planned POI, for the Falmouth Connector Project, to the regional transmission system will be near the existing Interconnecting transmission owner substation (Falmouth Tap). Mayflower Wind would construct the Project all the way to the POI at Falmouth Tap using an underground route within the municipal roadway layout. Transmission connections to the respective onshore substations to the POI at or near the Falmouth Tap substation or a new substation would be built in that area by the interconnecting transmission owner.

Carver, Canal, and Pilgrim

Carver substation meets basic electrical criteria for a POI, but the required onshore route to access the substation would be substantial—more than double the distance of onshore relative to other POIs considered. Accessing Canal substation would require passing the new Bourne substation, resulting in no advantage to interconnecting at Canal rather than Bourne. The Canal substation would be difficult to connect to because the equipment is aged and may require a complete rebuild. Interconnection to Pilgrim station would encounter many of the same electrical challenges as other POIs on or near Cape Cod, and accessing the POI would likely require a long marine route around Cape Cod, because the USACE has resisted cable access along the Cape Cod Canal. For these reasons, these locations were eliminated from further consideration.

Kent County

Kent County substation is a 345-kV substation located in Kent County, Rhode Island. The offshore and onshore routes to access the Kent County 345-kV substation have feasibility challenges. The onshore route would encounter dense congestion of underground utilities in the roadway, and the offshore route would have to avoid other proposed projects, limiting the available area for installation activities. For these reasons, this location was not pursued at this time.

Mystic

Mystic substation is the site of an existing power plant that is in the process of being retired. The retirement of the plant provides electrical capacity to interconnect to this site. However, this POI is the greatest distance from the Clean Energy Resource of any of the options considered. While the plant is sited adjacent to the Mystic River, the ability to route offshore cable from the Clean Energy Resource has multiple obstacles, with the only viable route avoiding Boston Harbor. For these reasons, this location was not pursued at this time.

K Street

The K Street substation is similar to the Mystic substation in that it would require a long marine route around Cape Cod. The K Street substation lacks the electrical capacity found at Mystic substation. In addition, the K Street substation site is small and would be difficult to expand since the area is an active industrial site. For these reasons, this location was not pursued at this time.

4.3.2.2 Preferred POI

In 2021, Mayflower Wind established ISO-NE interconnection queue positions with a POI at Brayton Point that will be used for development of this separate 1,200 MW connector project to optimize and deliver the full Clean Energy Resource potential output (estimated 2,400 MW) from the Lease Area. Brayton Point was identified as a feasible POI (considering the use of HVDC transmission technology) during the analysis of potential POIs for the Falmouth Connector Project. The establishment of a favorable ISO-NE queue position for the POI at Brayton Point combined with the feasibility of the POI resulted in the determination of Brayton Point as the preferred POI for the Brayton Point Project. The Brayton Point site (Figure 3-1) has been used for decades as a hub for regional energy generation and transmission and is currently occupied by 345-kV and 115-kV transmission line assets and substations meaning reduced network upgrades. Its shorefront location on Mount Hope Bay makes it an ideal location for redevelopment and an interconnection point for the offshore-generated Clean Energy Resource to inject renewable clean energy into the existing electric grid.

Brayton Point

Mayflower Wind has chosen the Brayton Point POI as the preferred injection point as it offers significant injection capacity and multiple positive attributes for interconnection. The Brayton Point POI is located at the National Grid 345-kV GIS substation. Brayton Point is the site of a recently decommissioned fossil fuel (coal/oil) fired 1,600-MW base load power plant located on an approximately 300-ac (121-ha) brownfields site on a peninsula of land surrounded by Mount Hope Bay, the Lee River, and the Taunton River. The National Grid substation at Brayton Point is connected to the bulk power grid by two 345 kV lines which run north to Medway as well as several 115 kV lines running north, east, south, and west. Brayton Point is an ideal site for the interconnection of offshore wind such as the Clean Energy Resource for several reasons, including, among others: (i) the robust 345-kV regional transmission infrastructure available there, (ii) the brownfields legacy of the site, which both reduces impacts to the natural environment and provides an opportunity to revitalize it for clean energy uses and for the benefit of the community, (iii) its waterfront location, and (iv) its lack of residential abutters.

Mayflower Wind will commission the development of a new HVDC converter station to convert the Project's HVDC power to 345-kV HVAC for interconnection with the Brayton Point POI. The HVDC converter station will include the development of a new 345-kV AIS substation (collectively, the HVDC converter station). The HVDC converter station will be located on the central portion of the Brayton Point site immediatley north of the two 500 feet tall concrete cooling towers that were razed in 2017 when the former Brayton Point Power Station coal-fired plant was decommissioned. The onshore export cables will enter the converter station site from the northwest or from the southeast corner, depending on which onshore export cable route is chosen. From the converter station, the 345-kV underground transmission lines will exit the converter station and travel south for interconnection at the existing National Grid substation.

4.3.3 Landfall Locations

With the determination of the POI to be located at Brayton Point, the next step in the initial route screening process for the Project was to identify potential landfall locations where the transition from

offshore export cabling to onshore export cabling would take place. Mayflower Wind used the following criteria to identify potential landfall locations:

- Available land able to accommodate the entry pit and drilling equipment associated with HDD as well as the necessary permanent offshore-to-onshore transition infrastructure (e.g., waterfront parking areas or other previously-disturbed open areas);
- Clear pathway to a roadway layout or other corridors of sufficient width to accommodate the installation of the duct bank and manholes;
- Sufficient water depths to accommodate the use of support barges at the HDD exit location;
- Avoidance of existing infrastructure, including submarine cables offshore and underground utility cables/pipelines onshore that would make construction infeasible;
- Avoidance and minimization of construction-period impacts to the public such as seasonal land and marine uses;
- Avoidance of hazardous materials sites or environmental containment sites at Brayton Point;
- Environmental considerations that avoid or minimize for impacts to wetland resource areas, such as salt marshes, coastal beaches, and mapped eelgrass habitat;
- Avoidance or minimization of impacts to environmental justice populations; and
- Minimization of overall length of the onshore export cable route balanced against avoidance of adverse impacts.

Mayflower Wind will use HDD technology to transition between the offshore and onshore components of the Project. Water depth at the landfall approach is an important factor for HDD. The HDD exit pit would be located offshore at water depths between 6.6 to 32.8 feet (2.0 to 10.0 m). The final selected landfall 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.

Many factors were considered and weighed when choosing or excluding landfall locations. Physical space availability was evaluated primarily for construction and installation. Mayflower Wind considered landfall locations which minimize the crossing of existing submarine cables, minimize conflicts with marine transportation and recreational boating, minimizing impacts to onshore land uses and provide adequate workspace for the HDD installation and viable onshore installation routes to the POI. Mayflower Wind assessed land uses adjacent to potential landfall locations to understand environmental impacts, potential for use of existing infrastructure, and areas with historic and conservation districts, neighborhoods or businesses that could be impacted.

As explained above, the POI analysis determined Brayton Point as the optimal POI for this Project, thus narrowing the landfall location analysis to the area immediately offshore from Brayton Point on the west and east sides. The landfall locations immediately offshore from Brayton Point have been determined as the most efficient routing options. Landfall considerations associated with the down-selected onshore route passing through Westport and Fall River are explained below.

4.3.3.1 Potential Intermediate Landfall Locations Assessed and Eliminated

Horseneck Beach Landfall

The potential intermediate landfall location at Horseneck Beach in Westport, Massachusetts would utilize a large public parking lot (over ten acres) which services visitors to Horseneck Beach State Reservation. Landfall via HDD to the Horseneck Beach parking lot appears feasible (Figure 3-5), but it is

unclear how the cables would cross Westport River and continue north on Route 88. Two options were considered: (1) suspend the cable from the bridge in a utility cavity or (2) HDD under the river. Because the Norman Edward Fontaine Bridge is a drawbridge, suspending the cables will not work. HDD is infeasible because there is no feasible location to land the cables north of the Westport River crossing. The area is salt marsh and fringes of bordering vegetation wetlands, and wooded areas are located alongside Route 88 before transitioning to residential properties abutting the waterway.

Westport River Landfall

The feasibility of continuing the offshore cable route up the Westport River instead of making an intermediate landfall at Horseneck Beach was considered. However, Westport Harbor and Westport River are challenging places to make cable landfall. The waterbodies are fertile with eelgrass and shellfish habitat (including clam, mussel, oyster, and scallop) and popular for boating. The banks of the river consist of areas of salt marsh, bordering vegetated wetlands, wooded areas or residential properties abutting the coast. The area immediately west of Route 88 has been designated by the MHC as a local historic district. Downstream of the Norman Edward Fontaine Bridge, there are no suitable roadways or parking lots to make landfall with an HDD.

TABLE 4-2. DISQUALIFIED CABLE LANDFALL LOCATION EVALUATION

No.	Name	Town	Grade	Comments
1	Horseneck Beach (Intermediate Landfall)	Westport	Disqualified	Would require crossing of Westport River on north side of beach landfall. Suspending cable from existing draw bridge is infeasible and use of HDD to cross under the river is infeasible due to presence of marshlands and abutting residential properties.
2	Westport River (Intermediate Landfall)	Westport	Disqualified	Would require a cable up the Westport River which is a productive eelgrass and shellfish habitat as well as a popular recreational boating location. Marshlands abutted with residential properties and a lack of suitable roadway or parking lots make landfall problematic. Area west of Route 88 is designated as a Local Historic District.

4.3.3.2 Potential Final Landfall Locations Assessed and Selected for Further Evaluation

Brayton Point – Lee River

The landfall location for the Preferred Route approaches Brayton Point from the Lee River on the west side of the peninsula (Figure 3-2). At the termination of the offshore export cable route in the mouth of Lee River west of Brayton Point, HDD will be used at the sea-to-shore transition from offshore to onshore export cables southwest of the proposed onshore HVDC converter station. From the onshore HDD transition location, the cables will be routed as an underground HVDC cable alongside an existing gravel access road for approximately 0.6 mi (1.0 km) to the proposed HVDC converter station.

There are no known existing submarine cables that make landfall at the west side of Brayton Point and there are no potential impacts to abutting property owners along the western shoreline or other infrastructure with the onshore transition being made within a developed area formerly used for power plant operations.

Brayton Point – Taunton River

This landfall location on the east side of Brayton Point via the mouth of the Taunton River is presented as the Noticed Alternative to the landfall location for the Preferred Route. The Taunton River Landfall is located approximately 1,800 ft (547 m) to the southeast of the Lee River Landfall on the opposite side of the Brayton Point peninsula (Figure 3-2). From the onshore HDD transition location, the cables would be routed alongside Brayton Point Road, across the existing National Grid easement, and alongside existing access roads for approximately 0.4 mi (0.6 km) to the proposed HVDC converter station.

This landfall would require the use of Brayton Point Road for the export cables which could have an impact on business operations associated with the Brayton Point Commerce Center. The Commerce Center also utilizes an area along the shore of the peninsula south of the proposed HDD transition location. Equipment staging and set-up for the sea-to-shore transition would likely interfere with boat traffic and operations at the Commerce Center. The sea-to-shore transition equipment and staging operations would also be located immediately south and offshore from Brayton Point Beach and residential properties which would likely have greater visual and noise impacts during construction compared to work conducted on the west side of the peninsula. There are no known existing submarine cables that make landfall at the east side of Brayton Point. The Taunton River includes the Fall River Harbor Project main shipping channel. The main shipping channel has a dredge depth of 35 ft (10.6 m). There is also a privately maintained 34 ft (10.4 m) wide dredged shipping and associated 50 ft (15.2 m) wide turning basin in the Taunton River that provides large vessel access to the eastern approach to Brayton Point. If Mayflower Wind were to install cables beneath the shipping channels, the offshore export cables would need to be installed a minimum depth of 10 ft (3.0 m) below the bottom elevation of the dredged channels. Installing a series of cables within this dense area of maritime uses introduces additional risks for construction, operations and maintenance of the Project.

TABLE 4-3. BRAYTON POINT LANDFALL LOCATION EVALUATION

No.	Name	Town	Grade	Comments
1	Brayton Point – Lee River (Final Landfall)	Somerset	Feasible	Good egress and elevation; area protected by an armored shoreline. Route avoids the main shipping channel in Mount Hope Bay, and the shipping channel and turning basin located at the mouth of the Taunton River.
2	Brayton Point – Taunton River (Final Landfall)	Somerset	Less Feasible	Good egress (a large parking lot). Separation distance between cables could prove problematic within active federal and private navigation channels. The privately maintained shipping channel, turning basin and berth would be impacted during the cable-lay. Close proximity to the Borden Flats Lighthouse which is listed on the National Register of Historic Places as the Borden Flats Light Station. Borden Flats, where there are shallow water depths, poses an obstacle to deeper draft offshore vessels, that could affect the achieved burial depth of the cables, resulting in the need for supplementary cable protection. HDD operation located on the seaward side of the "Ripley Street Parcel" which contains a tidal creek, salt marsh ecosystem, and Brayton Point Beach.

The landfall locations selected for further evaluation include the Brayton Point - Lee River and Brayton Point - Taunton River landfall locations (Table 4-4).

TABLE 4-4. SUMMARY COMPARISON OF FINAL MASSACHUSETTS LANDFALL LOCATIONS

Factor	Brayton Point – Lee River	Brayton Point – Taunton River
Adequate space for onshore HDD	Yes	Yes
Access to public roads/ways	Yes	Yes
Conflicts with existing offshore cable areas	No	Potential
Potential for environmental impacts	Low	Low
Retained for routing analysis	Yes	Yes
Navigation/Shipping	No	Yes

4.3.4 Sites for Proposed HVDC Converter Station

Two sites were considered for the proposed HVDC converter station. The preferred location is the proposed site located at Brayton Point approximately 0.2 mi (0.3 km) north of the POI at the existing 345 kV Brayton Point substation. Mayflower Wind considered another location for a converter station on an 8.28 acres industrial parcel located in Fall River, Massachusetts at the intersection of Almond and Ferry Streets (Figure 3-4). The Ferry Street parcel is located within an area zoned as industrial by the City of Fall River, which is located within a dense industrial/commercial/residential area. However, this site was deselected in favor of the proposed converter site location, which is immediately adjacent to the Brayton Point POI. This avoids the need for HVAC cabling across the Taunton River and the construction of a converter station in a dense, dual commercial/residential area in Fall River, and environmental justice population/community. The Brayton Point site has several favorable characteristics including available land, robust connection to the regional transmission system, previous use as a brownfield site (industrial use as a former coal plant), access and egress, and overall suitability contrasts greatly from other alternatives that would require longer onshore cable routes, greater terrestrial impact, and/or a greenfield site. Mayflower Wind has executed a lease agreement and has had positive communications with the landowner.

4.3.5 Onshore Routing

The routing of the onshore export cables is primarily dictated by the selected sea-to-shore landfall locations (Section 4.3.3) on Brayton Point. Mayflower Wind considered available corridors on the Brayton Point site to route the onshore export cables from the landfall locations to the selected site of the proposed HVDC converter station.

The potential routes were screened by using recent aerial photos, Massachusetts Geographic Information System (MassGIS) data on land use, regulated wetland resource areas and environmental constraints (e.g., presence of wetlands, rare species habitat) [Figure 1-7], and information gathered in discussions with municipal and state officials. The potential routes were eliminated from future screening if it was determined that they were clearly inferior based on environmental impact, constructability, cost and/or reliability. Based on this analysis, Mayflower Wind selected the most advantageous candidate routes for more detailed study and evaluation.

Initial screening criteria considered for onshore routing from the candidate landfall locations in Massachusetts to the HVDC converter station and ultimately the Brayton Point POI included:

- Direct routes are preferential to circuitous routes;
- Use of existing roadways and/or other available corridors;
- Adequate space available within the roadway layout and/or shoulder to accommodate the cable duct bank;
- Avoidance of subsurface utility conflicts;
- Avoidance and minimization of potential traffic impacts including major roadway crossings;
- Minimization of environmental impacts;
- Avoidance of densely populated residential and busy commercial areas;
- Avoidance of sensitive receptors (e.g., fire stations, hospitals, schools); and
- Construction feasibility.

Using the criteria listed above, Mayflower Wind identified two feasible potential onshore routes, as described in Section 3.

4.3.5.1 Candidate Onshore Cable Routes Evaluated and Advanced to Scoring

Many variables were considered in determining which onshore cable routes to advance. These alternatives will be designed to mitigate impacts to the local environment whenever possible.

Mayflower Wind identified two onshore cable routes, identified as Candidate Routes 1 and 2 from the Brayton Point landfall locations. These routes were advanced to the scoring phase of the route analysis. A detailed discussion of the results of the scoring can be found below in Sections 4.4 and 4.5.

Candidate Route 1: Brayton Point – Lee River

Candidate Route 1 is the Preferred Route. This route approaches Brayton Point from the Lee River on the west side of the peninsula (Figure 3-2). At the termination of the offshore export cable route in the mouth of Lee River west of Brayton Point, HDD will be used at the sea-to-shore transition from offshore to onshore export cables southwest of the proposed onshore HVDC converter station. From the onshore HDD transition location, the cables will be routed as underground HVDC cables to the north then east alongside an existing access road formerly used by the Brayton Point Power Station for approximately 0.6 mi (1.0 km) to the proposed HVDC converter station.

Candidate Route 1 will include the installation of underground HVAC transmission lines. The HVAC underground transmission lines will transmit the converted power from the HVDC converter station to the POI at the existing National Grid Brayton Point 345 kV substation, approximately 0.2 mi (0.3 km) south of the proposed HVDC converter station.

Candidate Route 2: Brayton Point – Taunton River

Candidate Route 2 is being considered as the Noticed Alternative Route. This route approaches the east side of Brayton Point via the mouth of the Taunton River (Figure 3-2). From the onshore HDD transition location, the cables will be routed alongside Brayton Point Road to the north then west utilizing existing Brayton Point access roads for approximately 0.4 mi (0.6 km) to the proposed HVDC converter station.

The above-described Candidate Routes are compared through the scoring analysis described below in Sections 4.4 and 4.5.

Candidate Routes 2 would include the installation of the same underground HVAC transmission lines as Candidate Route 1. The HVAC underground transmission lines would transmit the converted power from the HVDC converter station to the POI at the existing National Grid Brayton Point 345 kV substation, approximately 0.2 mi (0.3 km) south of the proposed HVDC converter station.

4.4 ANALYSIS OF CANDIDATE ROUTES FOR THE ONSHORE CABLES

The Candidate Routes described above were evaluated and ranked using a study area that was established to extend 500 feet in each direction from each route centerline and proposed HVDC converter station (Figures 4-1 and 4-2). A scoring methodology was then applied to each route's study area based on 11 individual criteria. The criteria were developed to reflect the defined routing objectives and compare the relative levels of potential impacts to the developed and natural environments along the Candidate Routes. Cost estimates were also developed for the Candidate Routes, and the reliability of each Candidate Route was assessed. The routing analysis identified the routes that best balance minimization of environmental impacts, reliability, and cost.

The offshore and onshore segments together form the complete Project route, but different criteria apply to the evaluation of offshore and onshore routes. Please refer to Section 4.6 for the offshore cable route criteria which are based primarily on marine survey results, consultation with the Massachusetts Ocean Team members (MEPA Office, Massachusetts Office of Coastal Zone Management, Department of Fish and Game, and Department of Environmental Protection), and constructability considerations. The purpose of the scoring analysis described in this section is to identify a preferred route for the onshore export cables that best balances minimization of environmental effects, reliability, and cost, evaluated based on the criteria described below.

4.4.1 Description of Scoring Criteria

The scoring criteria for the developed environment and natural environment used to evaluate the Candidate Routes are summarized in Table 4-5.

Developed Environment Criteria are used to compare the existing conditions of the developed environment and surrounding population among the Candidate Routes with any potential impacts that may occur as a result of the Project. Mayflower Wind applied the following Developed Environment Criteria in the scoring analysis of each Candidate Route:

- Residential Units
- Sensitive Receptors
- Potential for Traffic Congestion
- Historic Resources
- Archaeological Resources
- Potential to Encounter Subsurface Contamination

Natural Environment Criteria are used to compare the existing conditions of the natural environment and surrounding population between the Candidate Routes with any potential impacts that may occur as a result of the Project.

The five natural environment criteria included in the scoring analysis are:

- Flood Hazard and Wetland Resource Areas
- State-listed Rare Species Habitat

- Public Water Supplies
- Article 97-Jurisdictional Land
- Tree Removal

Constructability factors, such as subsurface utility density, are reflected in the cost analysis in Section 4.7.

4.4.2 Criteria and Weight Assessment

Mayflower Wind assigned weighted values to an established set of individual criteria related to both the developed and natural environment based on professional judgment and siting experience to ensure that scoring results reflect the importance of respective criteria in the process. The criteria were developed based on Mayflower Wind's routing objectives, environmental considerations, and feedback from consultations with state agencies and municipal officials. The criteria are summarized in Table 4-5.

A scale of 1-to-3 for weighting was considered to reflect relative importance of each criterion specific to this Project, with 1 being the lowest weight and 3 being the highest weight. The weighting for individual criteria is depicted in Table 4-6. Based on the approach described above, a weight of 3 was assigned to Residential Units and Potential for Traffic Congestion. A weight of 2 was assigned to Sensitive Receptors, Flood Hazard Areas and Wetlands, Rare Species Habitat, Article 97-Jurisdictional Land, and Tree Removal. The remaining scoring criteria, Historical and Archaeological Resources, Potential to Encounter Subsurface Contamination, and Public Water Supplies, were assigned a weight of 1.

Once the weighting had been assigned, raw scores for each candidate route were developed and a ratio score was calculated to determine the relative score for each route. As presented in Table 4-7, based on the results of the weighting evaluation, the least impactful route overall was determined to be the Brayton Point – Lee River candidate route.

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TABLE 4-5. SCORING CRITERIA FOR THE MAYFLOWER WIND ROUTING ANALYSIS

Criteria	Basis for Inclusion	Data Source	Scoring	Raw Ratio Score
Developed Environment Criteria				
Residential Units	Residents along a Candidate Route may experience temporary traffic disruption, noise, and/or dust.	MassGIS standardized assessors' parcel mapping data set, aerial photography	Scored as the number of residential units with parcels located with each Candidate Route study area. Based on pre-filing consultations with the Siting Board, Mayflower Wind counted individual residential units for apartment or condominium complexes, whenever possible.	Not applicable. No residential units within the study area.
Sensitive Receptors (hospitals, schools, municipal emergency services such as police and fire, elder care facilities, daycare facilities, district courts, religious facilities, funeral homes, and cemeteries)	Sensitive receptors may be affected by temporary traffic disruption, street closings, construction noise, and/or other temporary impacts due to project construction. Continuous access may be required for certain sensitive receptors (e.g., hospitals and emergency services). If a receptor has multiple entrances, the impact can be less pronounced than under single-entrance scenarios.	Property assessment data from MassGIS and local online databases, supplemented as needed with Google and Bing 2018-2020 aerial imagery	Scored as the number of sensitive receptors (defined based on mapped land use types that are potentially sensitive to temporary or permanent impacts) located within each Candidate Route study area.	Not applicable. No sensitive receptors within the study area.
Traffic Congestion (Construction)	Traffic on public roadways may experience temporary increases in traffic density and congestion, traffic disruption, and/or street closings associated with installation of underground cables. Likewise, repair and maintenance of underground cables may also impact traffic.	Massachusetts Department of Transportation (MassDOT) class (ranking of 1 through 3): 1 - Local roads and private ways 2 - Minor arterials and major collectors 3 - Principal arterials 0 - Off-road segments such as an unconstructed (paper) road.	The traffic analysis was performed by dividing each Candidate Route into road segments, for which the MassDOT class was identified. Based on the MassDOT class of roadway, each segment was assigned a rank from 1 to 3, from lowest to highest potential for traffic impact. Local roads and private ways were assigned a "1"; minor arterials and major collectors were assigned a "2"; and limited-access and principal arterials were assigned a "3". Scored as number of roads impacted along route multiplied by ranking value based on MassDOT class of roadway.	Calculated by dividing the scored, weighted number of roads for each Candidate Route by the maximum total number weighted number of roads among all Candidate Routes.
Historic Properties	Protected historical properties may be affected by temporary construction related impacts, such as excavation, traffic disruption, noise and/or dust. Subsurface infrastructure is not expected to have permanent impact on historic properties.	MassGIS data from Massachusetts Historical Commission's (MHC's) Cultural Resource Information System to locate historic buildings, local historic districts, and National Register-listed individual buildings and districts. State Register of Historic Places, and local historic district inventories.	Scored as the number of historic resources within each Candidate Route study area.	Calculated by dividing the total number of historic districts/properties for each Candidate Route by the maximum total number of historic resources among all Candidate Routes.

Criteria	Basis for Inclusion	Data Source	Scoring	Raw Ratio Score
Archaeological Resources	Archaeological resources can be impacted by the disturbance of subsurface artifacts through intrusive activities such as earth movement and excavation. Archaeological resources may be impacted by construction activities in areas of moderate or high archaeological sensitivity. Designation as high or moderate sensitivity is limited to areas that have not been significantly disturbed by previous construction activities, and which appear to maintain natural stratigraphic integrity. “High” sensitivity areas include those areas that contain known archaeological sites and those that have not been markedly affected by previous land-altering activities. Proximity to well-drained soils on relatively flat or gentle slopes, waterbodies (e.g., wetlands, ponds, rivers, streams, or the coast), and known areas of historic land use (as represented by existing and previously documented historic structures) are considered to be of "High" sensitivity; Areas of "high" sensitivity potentially disturbed by prior land-disturbing activity are considered to be of “moderate” sensitivity. Areas of “low” archaeological sensitivity include those that are perennially wet or have been extensively altered by development, construction, excavation, and/or erosion and are therefore unlikely to contain significant archaeological resources.	Archaeological Sensitivity Assessment prepared for the Project	Scored as the total number of sites located within each Candidate Route study area mapped as “moderate” and “high” sensitivity areas.	Not applicable. No “moderate” or “high” sensitivity sites within the study area.
Subsurface Contamination	Subsurface contamination could add complexities to construction for special handling of contaminated soils and/or groundwater. The potential to encounter subsurface contamination was derived from the number of sites on or adjacent to each Candidate Route where a documented release of oil and/or hazardous materials occurred, or where past land uses potentially resulting in contamination have been documented in the MassDEP Bureau of Waste Site Cleanup (BWSC) online database, pursuant to the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000). This criterion was evaluated using the MassDEP BWSC online database.	MassGIS Activity and Use Limitations (AUL) and Chapter 21E Tier Classified Sites data layers MassDEP BWSC online database and EDR reports	Scored as the number of sites within the study area established for each Candidate Route where a documented release of oil and/or hazardous materials occurred, or where past land uses are associated with a high risk for contamination are documented in the BWSC database, pursuant to the MCP (310 CMR 40.0000). Presence of sites within each study area were counted regardless of clean-up status.	Calculated by dividing the total number of documented sites for each Candidate Route by the greatest total number of documented sites among all Candidate Routes.

Criteria	Basis for Inclusion	Data Source	Scoring	Raw Ratio Score
Natural Environment Criteria				
Flood Hazard Areas and Wetlands	Underground export cable and transmission cable installation can affect wetland resource areas through land disturbance, including work pad construction, vegetation removal, dewatering activities and construction of material laydown areas. Wetland resource areas applicable to the routing analysis, as defined in the Massachusetts Wetland Protection Act (WPA) regulations (310 CMR 10.00) and/or local wetlands regulations, include the following: • Bordering Vegetated Wetland • Coastal Bank and Beach • Isolated Vegetated Wetlands or Isolated Land Subject to Flooding • Bordering Land Subject to Flooding and Land Subject to Coastal Storm Flowage (100-year floodplain) • 200-foot Riverfront Area • Certified or Potential Vernal Pools	Wetland resource areas were identified using a combination of field delineations and utilizing ArcGIS with the most current MassGIS data available. MassGIS mapping of the Federal Environmental Management Agency (FEMA) National Flood Hazard Layer; MassGIS MassDEP Wetlands (2005) dataset	Calculated as the total length (mi) of each Candidate Route located within the 100-year floodplain (excluding Zone X) and within regulated wetlands	Calculated by dividing the total number of miles of 100-year floodplain (and regulated wetlands) encountered for each Candidate Route by the greatest total measured length among all Candidate Routes.
State-Listed Rare Species Habitat	Underground export cable and transmission cable installation in off-road locations can potentially impact protected habitats for state-listed rare species. Scoring of protected habitats (Priority or Estimated habitats) for state-listed species was derived from the acreage of each Candidate Route study area located in protected habitat for state-listed species.	MassGIS mapping of Natural Heritage and Endangered Species Program (NHESP) Priority and Estimated Habitat) areas. This information can also be obtained from NHESP through a formal Information Request	Scored as acreage of each Candidate Route study area within protected habitat (Priority or Estimated habitats) for state-listed species.	Not applicable. No state-listed protected habitat in the study area.
Public Water Supplies	Public water supply areas (i.e., Zone I and Zone II Water Supply Protection Areas and Wellhead Protection Areas) may be affected by construction activities.	MassGIS mapping of Zone I and Zone II MassDEP Wellhead Protection Areas	Scored as the length of each route that passes through a wellhead protection area.	Not applicable. No wellhead protection area in the study area.
Article 97-Jurisdictional Land	Underground cable construction can potentially affect conservation lands. For the purposes of this analysis, Conservation land properties that are primarily protected for conservation purposes (subject to Article 97 jurisdiction) and require legislative action for use of such lands. Underground installation within public roadways was assumed to have no impact on adjacent conservation lands.	MassGIS mapping of Protected and Recreational Open Space with the designated Article 97 attribute	Scored as the total number of Article 97 parcels located within each Candidate Route study area.	Calculated by dividing the total number of Article 97 parcels for each Candidate Route study area by the greatest total number of Article 97 properties among all Candidate Routes.
Tree Removal	Permanent tree removal may be required for the construction and safe operation of the overhead transmission line.	ArcGIS using interpretation of aerial photogrammetric mapping	Scored as the length of each route requiring permanent tree removal.	Not applicable. No forested habitat removal associated with either route.

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TABLE 4-6. SUMMARY OF CATEGORIES AND WEIGHTS USED IN SCORING ANALYSIS

Scoring Criteria	Weight	Rationale Behind Assigned Weight
Developed Environment		
Residential Units	3	Potential temporary disruption during construction.
Sensitive Receptors	2	Potential temporary disruption/disturbance from construction activities. Access needs to be maintained for essential services throughout construction. Some of these receptors have more than one point of access and egress, and/or access/egress would be managed through construction planning.
Traffic Disruption (Construction)	3	Likely unavoidable temporary impacts to traffic during construction for in-road construction. Traffic management plans (TMPs) would help manage and mitigate these impacts. Construction outside of high season, where possible, would substantially reduce the potential for impact.
Historic Properties	1	Limited potential for Project-related impacts associated with construction. Potential for visual effects on historic properties for permanent aboveground structures is limited to the HVDC converter station location.
Archaeological Resources	1	Potential to encounter archaeological resources within areas of high or moderated sensitivity.
Potential to Encounter Subsurface Contamination	1	Potential risks of contaminant discharge, hazard to construction crews, and potential special handling and disposal requirements.
Natural Environment		
Flood Hazard Areas and Wetlands	2	Potential sensitivity of these environmental resources as well as the permitting challenges associated with related impacts.
State-listed Rare Species Habitat	2	Potential disturbance of protected status and sensitivity of these resources to disturbance as well as the permitting challenges associated with related impacts.
Public Water Supplies	1	Project's construction-related activities would be performed in a manner that avoids impacts to water supply resources, and because the Project is not of a type that would pose a significant threat to these resources.
Article 97-Jurisdictional Land	2	Challenges associated with obtaining approval for use of these land subject to Article 97 jurisdiction and the associated risk to Project schedule.
Tree Removal	2	Potential for permanent disturbance to wildlife habitat.

4.4.3 Criteria Evaluation Methods

After identifying the scoring criteria, Mayflower Wind conducted a scoring evaluation for each Candidate Route. Each route was scored, weighted, and ranked to reflect its potential for impacts to the developed and natural environments, as well as the relative ease of constructability. For the purposes of scoring, the scored route extends from the HDD landfall location to the POI. Mayflower Wind applied weights to the evaluation criteria that were deemed to be of higher significance than other criteria. A scale of 1-to-3 for weighting was considered appropriate to reflect the relative importance of each criterion specific to this Project, with 1 being the lowest weight and 3 being the highest weight.

Mayflower Wind assessed each criterion based on raw data (gathered field and online data and mapping) for each Candidate Route and identified the Candidate Route that had the highest score. All

other routes were then compared against this number to arrive at a "ratio score" for each Candidate Route on a scale of 0 to 1. The ratio score normalizes the results by assigning a score of 1 to the route with the largest number weighted value for a particular criterion. All other routes are assigned a fraction relative to that highest weighted route. For example, for the residential unit criteria if route X has a score of 4, route Y has a score of 8, and route Z has a score of 16, then the ratio scores would be X = 0.25, Y = 0.5 and Z = 1.0, respectively.

The lowest ratio score therefore equates to the lowest potential for impact. For each criterion, the ratio score was then multiplied by its assigned weight to produce a weighted score that reflected the relative importance of the criterion.

For each Candidate Route, the analysis generated a "total ratio score" by summing all of the individual ratio scores from the scoring criteria as well as a "total weighted score" by summing all of the individual weighted scores from the scoring criteria. The total weighted scores were then sorted in order, from low to high, to identify a given Candidate Route's "rank." The lowest weighted score equates to the lowest potential for impact with emphasis on certain criterion as previously described in this section. The ranks developed in this routing analysis are based on the total weighted scores.

4.5 Routing Scoring and Selection of Preferred Route and Noticed Alternative

4.5.1 Route Scoring and Selection

Mayflower Wind selected the Preferred Route based on the environmental evaluation criteria established in Section 4.4.1 and in consideration of cost, constructability, and municipal and regulatory input. As described in Section 4.3, the Mayflower Wind began with a broad routing analysis that resulted in the selection of suitable landfall locations, substation locations, and the POI. The subsequent onshore routing analysis resulted in a refined set of two Candidate Routes to carry into scoring and depicted in Figures 4-1 and 4-2.

The discussion below is focused on results from the environmental scoring developed for the onshore portion of the export cable route, and thus is targeting the onshore routing. Offshore routing analysis is presented in Section 4.6 and is also included in the analyses of cost and reliability provided in Sections 4.7 and Section 4.8, respectively. The raw scoring data for the routing analysis can be found in Attachment E – Route Scoring.

The weighted ratio scores for Candidate Routes 1 and 2 are contained within Table 4-7. In considering the relative merits of the routes, Mayflower Wind assessed the two Candidate Routes on criteria defined in Section 4.4.1. On this basis, Candidate Route 1 scores better (4.37) than Candidate Route 2 (9.00), as depicted in Table 4-7. In particular, Candidate Route 1 is superior to Candidate Route 2 with regard to the potential for local traffic disruption, flood hazard and wetland resource areas, and conservation/recreational lands.

TABLE 4-7. COMPARISON OF WEIGHTED SCORES - CANDIDATE ROUTES

Scoring Criteria[a]	Preferred Route [Candidate Route-1] *(Brayton Point – Lee River)*	Noticed Alternative Route [Candidate Route- 2] *(Brayton Point – Taunton River)*
Residential Units	0.00	0.00
Sensitive Receptors	0.00	0.00
Potential for Local Traffic Disruption	1.00	3.00
Historic Resources	1.00	1.00
Archaeological Resources	0.00	0.00
Potential to Encounter Subsurface Contamination	1.00	1.00
Subtotal for Developed Environment Criteria	***3.00***	***5.00***
Flood Hazard and Wetland Resource Areas	1.37	2.00
Rare Species Habitat	0.00	0.00
Public Water Supplies	0.00	0.00
Conservation/Recreation (Article 97) Lands[b]	0.00	2.00
Tree Clearing	0.00	0.00
Subtotal for Natural Environment Criteria	***1.37***	***4.00***
Total	**4.37**	**9.00**

[a] The weighted scores are based on an evaluation of the criteria inventoried within a 1,000 ft Study Area, measured 500 ft to either side of the onshore export cable routes and the HVDC converter station site.

[b] Although a segment of Brayton Point Beach and associated Article 97 Lands are located within the Study Area, no Article 97 Lands are traversed by any of the Project components including the offshore export cables.

Based on the above analysis, Mayflower Wind has selected Candidate Route 1 as the Preferred Route, and Candidate Route 2 as the Noticed Alternative Route. A detailed comparison of the Preferred Route and Noticed Alternative is presented in Section 5.

Noticed Variation

Mayflower Wind also identified, for the Siting Board's consideration, a design variation to the Project intended to minimize impacts to the community and the environment while providing flexibility for the future expansion of the electric system in the Brayton Point area to accommodate the likely need to connect additional new renewable energy generation. This "Noticed Variation" would facilitate the delivery of an additional estimated 1,200 MW of renewable clean energy by "right-sizing" certain facilities (primarily trenching and conduit for onshore underground transmission cables) to minimize any likely siting, cost, community and environmental impacts. The Noticed Variation would involve sizing underground infrastructure for the HVDC export cables to include spare conduits at landfall and onshore that would be capable of accommodating an additional 1,200 MW HVDC circuit consisting of an additional two power cables and one communications cable. Developing the Project in this way would mean only one disturbance to the natural and developed environment, rather than a second time when a second 1,200 MW connector project might be needed in the future for the export cables.

No change to the environmental criteria scoring was identified during the routing analysis when compared to the Project's 1,200 MW design. The primary difference in the Project and the Noticed Variation is in the physical size of the underground infrastructure resulting in deeper trenching. While the costs of the Noticed Variation are slightly higher to install relative to the Project, it will have similar environmental impacts, while providing potential synergy for future interconnection of renewable clean energy. Overall, Mayflower Wind's analysis demonstrates that the Project will achieve an appropriate

balance among conflicting environmental concerns as well as among environmental impacts, reliability, and cost.

4.5.2 Geographic Diversity

The Preferred Route and the Noticed Alternative Route have some measure of geographic diversity, with geographically distinct landfall locations and routes to the HVDC converter station site. Given the circumstances of (i) a single HVDC converter station location at Brayton Point, (ii) limited feasible landfall locations at Brayton Point (iii) constricted space and legacy environmental contamination in areas at the site, and (iv) Mayflower Wind's intent to minimize environmental impacts, the geographically distinct routes, though somewhat close to one another, provide some measure of geographic diversity in accordance with the Siting Board's standards and precedent.

4.6 Analysis of Offshore Export Cable Corridors

The following section describes how the initial route concepts associated with the anticipated POI were refined and optimized and provides details regarding the offshore ECCs that were analyzed, and the basis for selection of a final preferred route. The offshore ECCs are shown in Figure 4-3 and Figure 1-1.

4.6.1 Surveys and Studies

Mayflower Wind has executed a number of marine field survey programs as well as desktop and modeling assessments in 2020, 2021, and 2022 which support the evaluation of ECC options. Relevant surveys and assessments include:

- Geophysical and Geotechnical Surveys – Conducted in 2020-2022
    - Data were collected using a variety of tools including multibeam echosounder, multibeam bathymetry, magnetometer, side scan sonar, sub-bottom profiler, single channel and multichannel ultrahigh resolution seismic.
    - Data collected to provide sufficient information on the seabed and shallow sub-seabed conditions to support planning, engineering, and installation of one or more export cables.
    - Data collected to identify potential natural and anthropogenic hazards and other features that could impact route selection, cable design, installation techniques, and long-term integrity of the cable(s).
    - Data collected to support the Marine Archaeological Resources Assessment and characterize archaeological and paleo landform features within the Brayton Point offshore ECC.
- Hydrodynamics and Sediment Transport Modeling – Conducted in 2021-2022
    - Data collected include surface sediment grab sample data to characterize sediments along the ECC.
    - Modeling exercise to assess the sediment plume dispersion (Total Suspended Solids [TSS] in the water column and seabed deposits) associated with the installation of the export cables between the Lease Area and Brayton Point landing, including the nearshore HDD entry points that will be used to bring the cable ashore.
    - Hydrodynamic modeling exercise to address the concentrations of excess sediment suspended in the water column (as total suspended solids) following seafloor disturbance during cable installation.
    - Sediment transport modeling exercise to address the extent and thickness of sediment re-deposited to the seafloor following suspension.

- Benthic and Shellfish Resources Characterization Surveys – Conducted in Summer 2021 and Spring 2022
    - Sediment grab samples for laboratory analysis of benthic biotic community structure and physical parameters (e.g., grain size) and total organic carbon.
    - Real-time video in conjunction with grab samples.
    - SPI/PV imaging data.
- Designated Protected Areas Assessment – Conducted in 2020, 2021, and 2022
    - Desktop evaluation of Massachusetts and federal resources and protected areas along the ECC.

4.6.2 Criteria for Evaluation

Numerous technical and environmental considerations and constraints have factored into determining the location of the ECCs and comparing ECC options to each other, including:

- Cable route length
    - Minimizing cable route length (and therefore cable length) can reduce the number of offshore splices and thereby reduce costs.
- Water depth
    - Water depths greater than 20 ft (6.1 m) are most suitable for accommodating the cable laying vessels that are likely to be utilized for this Project. Shallower depths are feasible, but may require specialized installation equipment (i.e., purpose-built shallow-draft cable lay barge).
- Seabed conditions
    - Sand waves and highly mobile sediments
    - Boulders/boulder fields
    - The route should be perpendicular, or nearly perpendicular, to any large seabed slopes.
    - The corridor should avoid or minimize impacts to natural resource areas, including but not limited to North Atlantic right whale habitat, hard/complex bottom, and eelgrass.
- Obstructions
    - Anchorage areas, navigational or other dredged channels, and areas with mapped shipwrecks and boulders are to be avoided or mitigated.
- Existing and planned infrastructure
    - The corridor should consider the presence of other existing offshore cables and/or pipelines and intended location of planned future cables and/or pipelines, in order to mitigate (if possible) or carefully manage the risks associated with installing and maintaining cables in proximity to other infrastructure.
    - The route should be perpendicular, or nearly perpendicular, to any existing offshore cables and/or pipelines (or planned future offshore cables and/or pipelines).

4.6.3 Alternative ECCs Considered

Within the Brayton Point export cable corridor, two offshore export power cables and associated communications cabling will start at the OSP 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. The

offshore ECC enters Massachusetts state waters southwest of Brayton Point in Mount Hope Bay after traversing through Rhode Island state waters.

Results from the geophysical and geotechnical surveys conducted in 2020-2022 described above as well as results of a benthic survey program were used to evaluate the offshore route segments associated with the POI at Brayton Point.

Mayflower Wind intends to maintain an ECC width between approximately 1,640 ft (500 m) to 2,300 ft (700 m) to allow for maneuverability during installation and maintenance. The ECC may be locally narrower or wider to accommodate sensitive locations, to provide sufficient area for anchoring, and/or near landfall locations.

In Massachusetts waters, the offshore ECC diverges into two alternative approaches and landfall locations. The route options retained for evaluation are described in the following sections.

4.6.3.1 Lee River (Western Approach)

The Preferred Route for the offshore export cables proceeds northeast for approximately 2.1 mi (3.4 km) through Mount Hope Bay, entering the mouth of the Lee River, in Somerset and make landfall on the western side of Brayton Point. This route avoids the main shipping channel in Mount Hope Bay and the shipping channel and turning basin located at the mouth of the Taunton River.

4.6.3.2 Taunton River (Eastern Approach)

The Noticed Alternative Route proceeds northeast for approximately 2.4 mi (3.9 km) through Mount Hope Bay, entering the mouth of the Taunton River on the eastern side of Brayton Point in Somerset, near the Fall River municipal line. The Noticed Alternative Route poses multiple constraints that are avoided by using the Lee River approach.

Mayflower Wind is proposing two offshore export power cables plus associated communications cabling to make landfall at Brayton Point. While the cables will be installed in a bundled configuration where practicable, the cables may need to be installed separately in shallow water and near the approach to landfall. In case the offshore export cables need to be installed unbundled, adequate separation needs to be maintained between the cables when the cables are laid along the seafloor for safe installation, burial, and repair. Adequate separation distance could prove difficult to achieve within active federal and private navigation channels. The privately maintained shipping channel, turning basin, and berth located on the Taunton River side of Brayton Point would be impacted during the cable lay operations and could be encumbered by the installation of the submarine cables.

The cable lay operations would occur in proximity to the Borden Flats Lighthouse which is listed on the National Register of Historic Places as the Borden Flats Light Station. The offshore export cables would need to be installed across the Borden Flats where there are shallow water depths, which could pose an obstacle to achieving target cable burial, resulting in the need for supplementary cable protection.

The HDD operation for the eastern route would be located on the seaward side of the “Ripley Street Parcel” which contains a tidal creek, salt marsh ecosystem, and Brayton Point Beach. The operation of the Borden Light Marina located at the mouth of the Taunton River in Fall River may also be disrupted during the in-water cable-lay installations.

4.6.4 Comparison of ECCs

Mayflower Wind completed an evaluation of the ECC options, considering technical and environmental factors. The ECC option costs are compared in Section 4.7.

Based on the analysis of the ECC options as described in the sections that follow, the western option was the selected route corridor for reaching the Brayton Point POI because it will mitigate for technical risks and cumulative impacts to sensitive and protected habitats. Specific advantages of the Western Route include:

1) Provides the shortest cable length to the landfall location thus minimizing electrical losses;
2) Minimizes technical risks associated with steep seabed slopes, dredging operations, and moored buoys; and
3) Minimizes interaction with existing or planned infrastructure and other water-dependent uses including shipping and navigation channels and recreational areas.

4.6.4.1 Technical Considerations

Various technical considerations are important factors in the comparison and selection of ECC options. Relevant characteristics include:

- Cable route length
- Water depth
- Seabed conditions
- Obstructions
- Existing and planned infrastructure

These characteristics are described further in Section 4.6.2 and discussed below.

Cable Route Length

Minimizing cable route length (and therefore cable length) can reduce the number of offshore splices and reduce transmission losses thereby avoiding higher costs. The western and eastern ECC options leading to Brayton Point are compared on the basis of length, possible dredge volume, and length through mapped hard/complex bottom in Table 4-9. As shown in Table 4-9, the western ECC option is shorter than the eastern ECC option.

Water Depth

Water depths greater than 20 ft (6.0 m) are generally favorable for submarine cable installation. Water depths among the ECC options are compared in Table 4-9. Water depth within the northern half of Mount Hope Bay is typically less than 19.7 ft (6.0 m) relative to MLLW [1]. The offshore HDD exit would be located in deeper waters, where feasible, and a shallow draft vessel or barge would be preferred or the use of a lift boat. Due to the similarity in water depths for both ECC options, neither ECC is favored in terms of water depth.

Extremely shallow water depths < 15 ft (4.6 m) below mean sea level affect accessibility for the installation vessels. Local areas of extremely shallow water depths will be avoided to the extent practicable by micro-routing cables.

Seabed Conditions

Geologic and sea floor conditions influenced the siting and selection of ECCs.

[1] The water depth profile and bathymetric trends along the Brayton Point ECC were determined in surveys in 2020 and 2021.

Sand Waves and Highly Mobile Sediments

In general, pre-dredging may be required where large sand waves are present to achieve adequate depth of cover, and areas of highly mobile sediment also may require cable protection (e.g., rock berm or concrete mattresses) to mitigate for the risk of post-installation exposure of cables due to erosion.

There are no mobile bedforms within the Brayton Point ECC options in Massachusetts state waters. There are no existing seabed features that would suggest that scour may be a particular problem for the Project. The estimated dredge volume in state waters is equal for both route options, as dredging is only anticipated to be required at the HDD exit pits offshore. Therefore, no route is favored based on a substantially lesser amount of pre-dredging required prior to installation.

Steep Seabed Slopes

Seabed slopes can create challenges to cable installation and/or burial. A few localized areas of "steep" slope (defined by BOEM as being greater than 10°) are associated with exposed rocky areas and/or hard ground, undulating seafloor topography within Mount Hope Bay, and human activity such as dredging and anchoring. Steep seabed slopes were found in the eastern ECC option associated with the dredged shipping channel flanks.

Surface Boulders

The presence of very large individual boulders or boulder fields may require additional seabed preparations prior to installation of the offshore export cables. Boulder fields were identified within the ECC during the geophysical surveys conducted in 2021. Some surface boulders were identified along both the eastern and western ECC options. Surface boulders and boulder fields identified in Mount Hope Bay may be avoidable through cable micro-routing. Boulder fields in inshore and nearshore areas, such as in Mount Hope Bay, typically contain mostly small boulders.

Shallow Gas Accumulation

Biogenic gas was interpreted to be widespread within Mount Hope Bay. Blanking of seismic data during the geohazard surveys were used as the primary source of mapping the presence and extent of shallow gas. The seismic blanking starts directly at or beneath the seafloor and prevents visualization of the underlying conditions. Due to the widespread shallow gas, mapping of buried geohazards was made more difficult and adds uncertainty to the interpretation of potential buried geohazards. Besides adding uncertainty in the interpretation, biogenic gas is not expected to present any hazard to cable installation but signals a change in the soil properties (thermal conductivity, shear strength, fines content, etc.) of the seabed sediments that may have relevance to cable performance and long-term integrity if not considered properly in cable design. Biogenic gas within the cable zone may result in lower undrained shear strength in sediments where gas is present and may also lower the thermal conductivity of the soils.

The eastern ECC option crosses a greater area of mapped shallow gas accumulation than the western ECC option, potentially concealing additional buried geohazards and posing additional risk to cable performance and long-term integrity.

Sediments with Low Thermal Conductivity

Sediment thermal conductivity is relevant to cable performance and long-term integrity and should be considered in the cable design. Organic content in sediments may reduce the thermal conductivity of the sediments. Sediments with organic content and thus low thermal conductivity were identified in core samples taken from both the eastern and western ECC options. Thus, neither ECC option is favored

based on sediments with low thermal conductivity (except as noted above in the discussion of Shallow Gas Accumulation).

Anthropogenic Hazards

Planned and Existing Cables

Corridor selection also considers the presence of other existing offshore cables and/or pipelines or intended location of planned future cables and/or pipelines, in order to mitigate (if possible) or carefully manage the risks associated with installing and maintaining cables in proximity to other infrastructure.

Both ECC options are expected to avoid crossing existing cables and/or pipelines within Massachusetts state waters. Though the eastern ECC option encompasses a charted cable area spanning from Fall River Harbor to Brayton Point Beach[2], this charted cable area is expected to be avoidable via micro-routing of cables within the ECC.

Export cables from other offshore wind farm projects in the region may intersect the proposed Brayton Point ECC, but other proposed routes have not yet been made public or feasible and are therefore not considered in this ranking analysis.

Navigation Buoys

Navigation buoys and beacons mark dredged shipping channels in Mount Hope Bay. In addition to the navigation buoys, two seasonal water quality monitoring buoys managed by the RIDEM were also present within the Brayton Point ECC at the time of geophysical survey. Anchors and anchor wires can erode holes and trenches up to 2.6 ft (0.8 m) deep into the seabed. The anchoring systems of moored navigation buoys within Mount Hope Bay disturb the seabed and should be avoided. Micro-routing can be used to avoid navigation buoys for the ECC options under consideration. The western ECC option is preferable because there are no navigation buoys or RIDEM water quality monitoring buoys within the ECC, whereas there are four charted buoys within the eastern ECC option.

Debris

A large amount of anthropogenic debris is present within Mount Hope Bay, primarily related to fishing activity. Debris identified in northern Mount Hope Bay is likely related to fishing and construction activities. Small items like lobster traps or discarded tires may not require avoidance or removal measures. Large items may require avoidance or removal prior to cable installation.

Anthropogenic geoforms are present near Brayton Point. Rounded mounds of anthropogenic dredge deposit are scattered throughout Mount Hope Bay. Mounds in front of the Brayton Point cooling water outfall may have been placed to disrupt the laminar flow of cooling water and prevent erosion. Some rip rap deposits are also present along the shoreline of Mount Hope Bay.

Neither ECC option is specifically preferable over the other on the basis of volume or density of anthropogenic debris.

Bottom Fishing Activity

Bottom fishing comprises predominantly trap fishing, shellfish dredging and groundfish trawling. Trap fishing is not expected to pose a hazard to a buried cable. Shellfish dredging is also unlikely to penetrate more than 0.7 ft (0.2 m) into the seabed. Based on seabed scarring from trawl nets for catching groundfish in Mount Hope Bay, the maximum depth of disturbance of trawl or otter boards is estimated

[2] NOAA Office of Coast Survey Chart 13226, accessed 03/31/2022.

to be no more than 0.7 ft (0.2 m) and typically less than 0.3 ft (0.1 m). Evidence of the use of a rocking chair dredge to target hard clams or quahogs was found near Brayton Point. The rocking chair dredge appears to be a heavy device and could potentially penetrate up to 1.6 ft (0.5 m) into the soft sediments of northern Mount Hope Bay. Burial of the export cable will minimize risk of damage to the cable and prevent disruption to the fishing industry.

Neither ECC option is preferable over the other on the basis of volume or density of bottom fishing activity.

Dredging

The eastern ECC crosses a dredged shipping channel that runs along the eastern shore of Mount Hope Bay and into the Taunton River. A private branch of the main shipping channel ends in a turning basin at the former Brayton Point Power Station coal terminal. The Brayton Point channel is or was maintained to -34 ft (-10.4 m) and the turning basin to -25 ft (-7.6 m). HDD could be used to install the export cable(s) beneath the dredged channel. Due to potential future dredging operations, it would be necessary to install the export cables a minimum of 10 ft (3.0 m) below the dredge depth of the navigation channel under the eastern route option. Specialized cable installation methodologies may be required to achieve cable burial depth greater than 10 ft (3.0 m) below the seabed.

Therefore, the western ECC option is preferable over the other on the basis of dredging activity.

Shipwrecks and Paleolandforms

Potential submerged cultural resources and historic maritime properties were identified in surveys of the Brayton Point ECC. Further investigation may be conducted to determine whether the interpreted cultural resources meet the criteria for designation as a “historic property” according to the requirements of the National Historic Register, and/or whether any potential effects can be mitigated or minimized through methods other than simple circumvention of the interpreted resource. Historic maritime sites may include shipwrecks, downed aircraft, and aids to navigation; and paleo landforms that may preserve evidence of human occupation since approximately 13,000 years before the present.

One potential historic maritime site and two interpreted paleolandforms were identified in the Study Area within Mount Hope Bay. Mayflower Wind will continue its consultations with BOEM, the BUAR and the MHC to develop appropriate avoidance and mitigation measures.

Because the identified potential avoidance areas overlap between the common ECC, the western ECC option, and the eastern ECC option, neither ECC option is preferable over the other on the basis of shipwrecks and paleolandforms.

Existing and Planned Water Dependent Uses

The proposed export cables located within state waters, including the cable landfall, will not preclude the use of the immediate waterfront for vessel-related activities or other water-dependent activities. The Project will use an HDD landfall method to minimize impacts to nearshore and coastal waters. During construction, this installation method will require a temporary, short-term restriction on access to the waterfront within the immediate construction work areas and HDD path for safety reasons. However, there will be no long-term impacts to immediate waterfront areas, public access, or vessel related activities along the waterfront area. The preferred western ECC purposely avoids the Taunton River in order to avoid USACE’s dredged channels, an active wharf, and the boat ramp at Brayton Point.

The area of landfall is on private property that was formerly used as an industrial site (coal fired power plant), and therefore not commonly used for recreation. During the installation of the export cables there will be a temporary, short-term restriction on access to the waterfront within the immediate

construction work areas and HDD path for safety reasons. Additionally, there will be no long-term impacts to waterfront areas or to public access to the water's edge resulting from the Project, particularly for the preferred western route, as the Lee River has few recreational uses, whereas the alternate route through the mouth of the Taunton River passes by Brayton Point Beach and a walking area adjacent to residences.

Offshore Routing Constraints

Table 4-8 summarizes some of the key criteria that Mayflower Wind considered in the siting and routing of new submarine export cables in federal and state waters.

A summary of the physical characteristics considered in the comparison and selection of the offshore ECCs is presented below in Table 4-8.

TABLE 4-8. COMPARISON OF OFFSHORE EXPORT CABLE CORRIDORS PHYSICAL CHARACTERISTICS

Characteristics	Western (Lee River)	Eastern (Taunton River)
Offshore Length[a]	2.1 mi (3.4 km)	2.4 mi (3.9 km)
Minimum Water Depths[b]	0 ft to -16 ft (0 to -5 m)	0 ft to -16 ft (0 to -5 m)
Sand Waves Present (Y/N)	N	N
Highly Mobile Sediments Present (Y/N)	N	N
Steep Seabed Slopes Present (Y/N)	N	Y
Boulders/Boulder Fields Present[c] (Y/N)	Y	Y
Shallow Gas Present (Y/N)	Y	Y
Planned and Existing Cables and Pipelines[c] (Y/N)	N	Y
Moored Buoys	0	4
Dredged Channel (Y/N)	N	Y
Shipwrecks and Paleolandforms	3	3
Recreational Uses	N	Y

[a] Length shown is for each route segment within Commonwealth waters. The two ECC options are co-located for a large portion of the total ECC length, differing only in route at the approach to landfall at Brayton Point.

[b] The water depth profile and bathymetric trends along the Brayton Point ECC were determined in surveys in 2020 and 2021. Water depth is relative to MLLW.

[c] Existing cables and pipelines referenced here refer only to those within state waters. Existing cables and pipelines referenced here refer to the charted cable area near Brayton Point Beach, which are expected to be avoidable by micro-routing within the ECC but are noted due to proximity.

4.6.4.2 Environmental Characteristics

4.6.4.2.1 Ocean Management Plan Resources

The Massachusetts OMP specifies that cable projects (including those associated with offshore wind renewable energy projects) are only required to address their compliance with the performance standards for the following SSU natural resources: (1) core habitat of the North Atlantic right whale, fin, and humpback whales; (2) hard/complex seafloor; (3) eelgrass; and (4) intertidal flats, and the following water-dependent use (WDU): (1) fixed fishing facilities. More information about the OMP can be found in Section 6.3.7. The OMP contains mapping that delineates these SSUs and WDU. Figure 1-8 shows the OMP mapping of any SSUs or WDU located in the general Project area. The Project is not located in or

adjacent to any of the aforementioned SSUs or WDU within Massachusetts state waters.[3] Thus, neither the eastern nor western ECC option is preferred regarding potential impacts to these resources.

4.6.4.2.2 Other Environmental Resources

Both of the Brayton Point ECC options traverse mapped Shellfish Suitability areas (Figure 1-9). The western ECC option traverses suitable Quahog habitat, while the eastern ECC option traverses both suitable habitat for both Quahog and American Oyster. However, HDD installation may avoid or minimize impact to these areas.

Epifauna and Infauna observed in grab, video, and SPI-PV samples collected in Mount Hope Bay are characterized by Large Tube Building Fauna and isolated Gastropod Reefs (Crepidula). Isolated occurrences of algae, sessile gastropods, large deep-burrowing fauna were also seen.

No submerged aquatic vegetation (SAV) or eelgrass beds have been mapped by MassDEP in the landfall areas at Brayton Point. SAV and eelgrass beds were not observed in Massachusetts waters in benthic surveys in 2021 and 2022.

Based on the information contained herein, the western ECC is the preferred offshore route to make landfall at Brayton Point. Key features of the western ECC which favored this selection included:

1) Provides the shortest cable length to the landfall location thus minimizing electrical losses;
2) Minimizes technical risks associated with steep seabed slopes, dredging operations, and moored buoys; and
3) Minimizes interaction with existing or planned infrastructure and other water-dependent uses, including shipping and navigation channels and recreational areas.

4.6.4.3 Environmental Considerations along Preferred ECC

A discussion of the environmental impact-producing factors associated with the export cable installation and environmental considerations related to the selected western option is discussed below.

4.6.4.4 Export Cable Installation

Disturbance to the sea bottom from export 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 or rock placement. The seafloor may require preparation, including debris and boulder removal, prior to installing cables. Additionally, for areas where anchoring may be required, anchor impacts have been considered.

Cable Installation Tool

Cable installation tools are described in detail in Section 5.5.1.2. Depending on the installation survey findings and seabed conditions encountered, several preparation and installation methods may be utilized to install and bury the offshore export cables. These methods include vertical injector; jetting sled; jetting ROV; pre-cut plow; mechanical plowing; and mechanical cutting ROV system. These cable installation techniques can involve cable laying followed by burial and/or simultaneous cable laying and burial.

[3] The Brayton Point ECC passes through North Atlantic right whale core habitat within federal waters. Additional information can be found in Section 6.3.7.

Anchoring

It is expected that a moored vessel solution will be used for the offshore export cable installation in Massachusetts state waters. Nearshore areas and areas with shallow water less than 49.2 ft (15.0 m), which are the water depths encountered in the ECC in Massachusetts state waters, typically necessitate a moored vessel solution, as operation of DP vessel thrusters is typically not realistic in these water depths.

The maximum anchor radius from the cable installation barge will be approximately 1,640 ft (500 m) to 2,300 ft (700 m) based on the anchor line length. The maximum anchor radius will not extend outside of the width of the ECC.

Cable Protection

The primary objective is to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire cable route, by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. 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 techniques not involving addition of secondary cable protection material have been ruled out. Remedial burial techniques may include jet trenching or controlled flow excavation that fluidizes the surrounding seabed to allow the cable to further settle into the trench. 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.

Based on Mayflower Wind's preliminary interpretation of the geophysical and geotechnical marine surveys, Mayflower Wind estimates that approximately 15 percent of the offshore export cable route will require secondary cable protection, because of seafloor conditions, physical obstacles on the seafloor and crossing of existing subsea telecommunication cables. Placement of secondary cable protection would be considered a permanent alteration of Land Under the Ocean.

Though not currently anticipated, any required crossings of existing or planned 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.

Pre-installation Seabed Preparation

The seafloor may require preparation, including debris and boulder removal, prior to installing cables, if these are not avoidable by micro-routing within the ECC. An orange peel grabber may be used for localized boulder removal and a plow may be used for boulder field removal. A grapnel tool may be used for debris removal.

4.6.4.5 Wetlands

The Massachusetts regulations implementing the Wetland Protection Act (WPA) describe various coastal wetland resource areas. This section addresses coastal resource areas affected by the Project that are below mean low water. Wetland resource areas affected above mean low water are discussed in Section 5.2.1. The offshore ECC is located entirely within Land Under the Ocean (310 CMR 10.25), and certain segments pass through Land Containing Shellfish as defined in the regulations (310 CMR 10.34). These two resource areas and compliance with the relevant regulatory requirements are described below. The

use of HDD will result in the avoidance of impacts to nearshore areas, coastal beach, coastal dunes, and/or coastal bank.

4.6.4.6 Water Quality and Water Resources

Installation of the proposed offshore export cables will have localized and temporary effects on water quality, primarily related to trenching and dredging at HDD pits. Temporary sediment disturbance associated with Project activities will cause minor, short-term, and localized increases in total suspended solids along the ECCs. Use of cable burial methods that employ soil fluidization (i.e., jet-plowing) where possible will minimize sediment disturbance. Estimated impacts to Land Under the Ocean and Land Containing Shellfish in State waters only are described in Table 4-9, below.

TABLE 4-9. CABLE INSTALLATION - SEABED DISTURBANCE (STATE WATERS ONLY)

Parameter	Area of Land Under the Ocean (sq. ft [ac])	Dredge Volume (cy [m^3])	Area of Land Containing Shellfish (sq. ft [ac])
Preferred Route (cumulative)			
Seabed preparation and cable burial of the offshore export cables	426,888 (9.8)	0	221,981 (5.1)
Per HDD Entry and Exit	13,356 (0.3)	1,866 (1,427)	6,945 (0.2)
Total for Two HDD Entry and Exit	26,712 (0.6)	3,733 (2,854)	13,890 (0.3)
Noticed Variation (cumulative)			
Total for Four HDD Entry and Exit	53,424 (1.2)	7,466 (5,708)	27,780 (0.6)

Sediment Dispersion Modeling

Mayflower Wind completed a hydrodynamics and sediment transport modeling study of the Brayton Point ECC to estimate the area surrounding the offshore export cables that could be affected by re-sedimentation of sediment suspended during installation. A summary of the findings of the study are provided herein. The model evaluated the Brayton Point ECC within Mount Hope Bay based on physical characteristics that influence sediment suspension and dispersion (primarily grain size and localized current velocity).

Results of the sediment dispersion modeling for the ECC segments analyzed are summarized in Tables 4-10 through 4-12, below. The modeling indicated that TSS concentrations above 100 mg/L will become suspended in the vicinity of the cable installation during construction around the cable route center line in Mount Hope Bay. Where suspended sediments are the most widespread, TSS concentrations of 100 mg/L are predicted to extend to a maximum of 3,800 ft (1.16 km) from the cable installation center lines in Mount Hope Bay. TSS dissipates upon cessation of construction activities and is expected to fall below 100 mg/L after approximately 280 minutes in Mount Hope Bay. Turbidity levels associated with HDD dredging are much lower than those associated with cable trenching. TSS levels exceeding 100 mg/L are predicted at a maximum distance less than 820 ft (250 m) at the Brayton Point preferred landfall HDD Pit Area. TSS is expected to fall below 100 mg/L after approximately 100 minutes after construction activity.

In all simulated scenarios the maximum TSS level dropped below 10 mg/L within two hours and below 1.0 mg/L after less than four hours. These effects are expected to be temporary, short-term, and localized.

TABLE 4-10. AREA COVERAGE AND TIME FOR TSS CONCENTRATIONS TO DROP BELOW SELECTED LEVELS AFTER THE END OF CABLE INSTALLATION ACTIVITIES FOR SELECTED TSS CONCENTRATION THRESHOLDS IN MOUNT HOPE BAY

TSS Threshold (mg/L)	Maximum Distance from Indicative ECC Centerline (km)	Time for TSS to Dissipate (min)
10	4.40	2,980
50	1.83	860
100	1.16	280
150	0.99	160
200	0.74	140
250	0.57	120
500	0.32	100
>1,000	0.15	60

Source: Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment, Mayflower Wind Energy LLC | USA, 01 March 2022 - Final Report, Daniel L. Mendelsohn, Innovative Environmental Science and J. Craig Swanson, Swanson Environmental

TABLE 4-11. AREA COVERAGE FOR SELECTED TSS CONCENTRATION THRESHOLDS FOR HDD PIT EXCAVATION ACTIVITIES AND TIME FOR TSS TO DROP BELOW SELECTED LEVELS AT THE HDD SITES AFTER THE END OF THE RELEASE

TSS Threshold (mg/L)	Brayton Point HDD Pit Area Coverage (ha)	Maximum Distance from Release (km)	Brayton Point HDD Duration (min)
10	18.5	0.53	280
50	7.1	0.38	140
100	5.2	0.32	100
150	4.4	0.29	80
200	3.8	0.27	80
250	3.3	0.25	60
500	2.4	0.21	40
>1,000	1.4	0.17	20

Source: Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment, Mayflower Wind Energy LLC | USA, 01 March 2022 - Final Report, Daniel L. Mendelsohn, Innovative Environmental Science and J. Craig Swanson, Swanson Environmental

A range of cable installation methods have been proposed by Mayflower Wind and these methods have been chosen in order to provide the flexibility to achieve target cover depths in different soil types while minimizing to the extent practicable impacts to the seabed and water quality, which will be temporary in nature. The installation of the export cables will require temporary displacement of marine sediments to achieve the necessary cable cover depths. It is anticipated that the method(s) of installation will result in minimal alteration to the bathymetry of the seabed. As all impacts are anticipated to be minor and temporary, significant impacts to water circulation or sediment grain size distribution are not anticipated.

Offshore Vessel Refueling and Spill Prevention

Mayflower Wind will use a number of different vessels for the transportation, installation, and operation of Project components. The Project's vessel deployment plan will be finalized in coordination with selected contractors. A number of support vessels will also be used during all Project phases for support

tasks. Vessels used in construction will require refueling. Mayflower Wind anticipates that smaller vessels will refuel in port. However, larger installation vessels may require offshore refueling. Mayflower Wind will use a Jones Act-compliant bunker barge or vessel for offshore refueling. The offshore refueling process includes three primary activities including (1) mooring of the fueling vessel to the installation vessel, (2) transfer of fuel from the fueling vessel to the installation vessel, and (3) de-mooring from the installation vessel. In some cases, is may be necessary to relocate the installation vessel to a sheltered location for refueling. The offshore ECC locations in Mount Hope Bay are sheltered and near port facilities.

Mayflower Wind believes that all safety and environmental incidents can be prevented; the foundation of the Mayflower Wind Health, Safety, Security & Environment Policy is to ensure risk is managed effectively and to uphold corporate values of honesty, integrity and respect. Mayflower Wind has developed a Safety Management System 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. Mayflower 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.

Accidental discharges of vessel fuels and oil could occur during construction and decommissioning. Best management practices for refueling and equipment servicing will be in place. As accidental events may still occur, Mayflower Wind has included measures for cleanup of accidental releases in the Oil Spill Response Plan (OSRP) in accordance with the requirements of 30 C.F.R. Part 254. In accordance with 30 C.F.R. 254, the OSRP will demonstrate that Mayflower Wind can respond effectively in the unlikely event that oil is discharged from the Project. The OSRP will provide for rapid spill response, clean up, and other measures that would mitigate for any potential impact to affected resources from spills or accidental releases, including spills resulting from catastrophic events. Routine training and exercises regarding the content of the OSRP will be carried out regularly to prepare personnel to respond to emergencies should they occur. Secondary containment systems will be provided at operating areas more prone to spillage.

4.6.4.7 Rare Species

The Brayton Point Project site (onshore and offshore) is not located within MA NHESP mapped Priority or Estimated Habitats, as confirmed by the NHESP on April 28, 2022 (NHESP Tracking No.: 19-38917) (and as shown in Figure 4-4). Mayflower Wind will continue consultations with the NHESP and the DMF to ensure that impacts to rare species located within the ECC are avoided or mitigated to the greatest extent practicable.

SSU and WDU Areas

As described above in Section 4.6.4.2, the Project is not located in or adjacent to any of the SSUs or WDU identified by the Massachusetts OMP within Massachusetts state waters. More information about the OMP can be found in Section 6.3.7.

North Atlantic Right Whale Core Habitat

There is no North Atlantic right whale (*Eubalaena glacialis*) habitat located in the ECC within Massachusetts state waters, as shown on Figure 1-8. North Atlantic right whale core habitat is presented herein, since the SSU resource was presented in Mayflower Wind's January 2022 Massachusetts Coastal Zone Management Act Consistency Certification filed with BOEM and CZM.

The offshore ECC travels through North Atlantic right whale core habitat in federal waters. The North Atlantic right whale is both a state- and federally listed endangered species that regularly uses Massachusetts waters for feeding. The OMP established the North Atlantic right whale core habitat SSU

resource based on data that identified statistically significant use by right whales of certain areas of the Massachusetts coast.[4] Mayflower Wind has also developed a Marine Mammal and Sea Turtle Monitoring and Mitigation Plan that outlines specific measures that will be undertaken to protect North Atlantic right whales, including visual and acoustic monitoring, clearance zones, and use of additional advanced technologies during periods of night work or other low visibility conditions.

4.6.4.8 Marine Archaeology

Potential submerged cultural resources and historic maritime properties were identified in surveys of the Brayton Point ECC. Further investigation may be conducted to determine whether the interpreted cultural resources meet the criteria for designation as a "historic property" according to the requirements of the National Register of Historic Places or the State Register of Historic Places; and/or whether any potential adverse effects can be mitigated or minimized through methods other than simple circumvention of the interpreted resource. Historic maritime sites may include shipwrecks, downed aircraft, and aids to navigation; and paleo landforms that may preserve evidence of human occupation since approximately 13,000 years before the present.

Based on the geohazard marine survey completed by Mayflower Wind, one potential historic maritime site and two interpreted submerged paleolandforms were identified within the Study Area of the Preferred ECC and have been identified as "avoidance areas".

Archival and document research and field investigations were conducted as part of the cultural resource examination, and background research included a review of historic documents, previous research reports, a site file check, shipwreck inventories, secondary sources, and historic map analysis. Materials from archives at the BUAR were accessed. These data assisted in validating the geophysical data and interpretations.

4.6.4.9 Avian Resources

Mount Hope Bay has high avian species richness and abundance. Certain marine bird species may be disturbed by vessel-based construction activities. However, most birds within the ECC are likely habituated to vessel traffic. Although unlikely, there is a small potential for avian collision with vessels during low-visibility conditions. Most avian species (excluding gulls) are not likely be attracted to vessels during fair weather conditions. Therefore, because of the limited exposure to construction vessels, short term duration of construction and further behavioral limitation of proximity during fair weather conditions, no population level effects are expected for marine and coastal birds. Potential for collision risk will be further reduced with the use of down-shielding of lighting to the extent practicable to limit bird attraction and disorientation. Temporary displacement from forage areas associated with the construction activities will be of short duration. No long-term impacts to avian populations are anticipated.

4.6.4.10 Fish and Fisheries Resources

An important aspect of Mayflower Wind's siting strategy has been to avoid or minimize impacts, including impacts to fish and fisheries resources. The alignment of the ECC is intended to avoid or minimizer impacts to fish and fishing. Measures to mitigate for impacts include, but are not limited to:

- Routing of offshore export cables to avoid sensitive habitats used by fish to the greatest extent practicable;

[4] Massachusetts Geographic Information System [MassGIS], 2020c

- Ongoing consultation with commercial and recreational fisherman on the location of the cables;
- Planning and design of cable burial to reduce impacts to fishing during Project operations; and
- Implementation of a Fisheries Communications Plan, including the use of a Fisheries Liaison Officer before, during, and after cable installation (see Attachment F for the Fisheries Communications Plan).

Mayflower Wind is actively engaged in outreach and two-way communication with the fishing community and with organizations that work on the overlap of fishing and offshore wind. Those in the fishing community that Mayflower Wind has communicated with a range from individuals to fishing captains to large businesses, and the organizations range from federal agencies to non-profits to task forces. Mayflower Wind is currently working with three Fisheries Representatives (FRs), including the Massachusetts Lobstermen's Association (MLA), the New Bedford Port Authority (NBPA), and the Commercial Fisheries Center of Rhode Island (CFCRI). Mayflower Wind's FLO and other members of the team talk directly with fishermen, sit on boards and working groups of organizations alongside fishermen, and engage directly with fishermen in scientific research and other efforts. Project development has been and will continue to incorporate input from stakeholders in the fishing industry in a way that allows it to minimize interference with fishermen that have been fishing in the regional area for hundreds of years. Mayflower Wind will continue to strengthen existing and build new relationships with fishing organizations throughout Project development, construction, and operations.

Mayflower Wind's three FRs, the MLA, the NBPA and CFCRI, collaborate on initiatives that mitigate for impacts to fisheries in the Offshore Project Area, provide information to Mayflower Wind from the fishing industry, and disseminate information from Mayflower Wind to the fishing industry.

Commercial and recreational fishermen may be temporarily excluded from actively fishing within or transiting through the localized construction areas and safety zones around cable-lay vessels and barges during the construction phase of the proposed Project. This may result in a temporary loss of access to fishing grounds. Each construction activity will only cover discrete and localized portions of the Offshore Project Area on a temporary basis, relative to the available open water to navigate through, or grounds to fish within. Once construction activities are completed within safety zones, marine activities, including commercial and recreational fishing, would be allowed to continue as they normally would prior to construction.

4.6.4.11 Marine Mammals

Mayflower Wind evaluated the best available literature and government databases; local and regional information evaluating the habitat use, abundance, and distribution of marine mammal species known to occur in Massachusetts state waters. During the construction phase, marine mammals may co-occur with, and be affected by, Project activities in the export cable corridor within Mount Hope Bay.

Marine mammals that may be present within the Project Area within Mount Hope Bay include the harbor seal (*Phoca vitulina),* gray seal (*Halichoerus grypus*), harp seal (*Pagophilus groenlandicus*), and hooded seal (*Crysophora cristata*).

When in the vicinity of the ECC during construction, these species could be exposed to temporary stressors such as noise, increased vessel traffic, and equipment in the water that may result in short-term, localized disturbance of individuals.

Ship engines and vessel hulls emit continuous sound which overlaps with the hearing frequency range for all marine mammals.[5] Cable installation vessels are expected to have similar noise profiles.

[5] Erbe et al., 2019; National Science Foundation & USGS, 2011

Researchers have reported a change in the distribution and behavior of marine mammals in areas experiencing increased vessel traffic, likely due to increases in ambient noise from concentrated vessel activity.[6] Possible effects from vessel noise are variable and would be contingent on species and other factors such as the marine mammal's activity, its proximity to the vessel, and its habituation to the vessel traffic noise and vessel movements. Because vessel traffic throughout the area is typically high, marine mammals local to the area are presumably habituated to common vessel noise.[7] Construction vessels will likely be stationary on site for significant periods of time; large construction vessels will likely travel to and from the Project Area at low speeds, potentially producing lower noise levels than vessel transit at higher speeds.[8]

Potential exposure of marine mammals to vessels used during the construction phase is considered very low due to the high seasonality of marine mammals present in Mount Hope Bay and the low amount of time marine mammals spend at the surface. Several species of seals are known to commonly occur, at least seasonally, in Mount Hope Bay. There is a possibility that marine mammals may alter their behavior while in close proximity to vessels, but this avoidance behavior is expected to decrease vessel collision risk and isn't expected to significantly affect marine mammals in the Project Area. Project mitigation measures designed to reduce or eliminate vessel strikes with marine species will be implemented to further reduce potential effects of increased vessel traffic.

4.6.4.12 Conclusion

As described in the preceding sections, the following provides a concise summary of major findings relative to the offshore ECC.

- **Sediment dispersion:** Mayflower Wind anticipates that sediment mobilized during cable-laying will resettle rapidly, meaning that sediment mobilized during installation of the first cable will settle well before installation of the second cable based on sediment dispersion modeling.
- **Priority and Estimated Habitats:** No NHESP mapped habitats are present within the offshore ECC in Massachusetts waters.
- **Marine archaeological resources:** One potential historic maritime site and two interpreted paleolandforms were identified within the Study Area of the Preferred offshore ECC and have been flagged for avoidance. Mayflower Wind has sited and will execute the cable installation in a manner so as to avoid or minimize impact to marine archaeological resources to the extent practicable.
- **Avian:** Offshore cable installation activities may disturb marine birds, disrupt foraging, and experience slight increased potential for vessel collisions in the immediate area of construction. These potential impacts will not have long-lasting effects on resident or migratory marine birds.
- **Fish and Fish Resources:** Mayflower Wind has not proposed any restrictions on navigation, fishing, or the placement of fixed or mobile fishing gear for the post-construction condition. However, construction and installation activities may temporarily affect navigation and/or fishing activities in the immediate vicinity of construction and installation vessels. These impacts are temporary in nature and largely restricted to the Project's construction and installation period. Because potential impacts are temporary and localized, the impacts will not be significant.

[6] Mikkelsen et al., 2019; Tsujii et al., 2018; Pirotta et al., 2012; Erbe, 2002a; Jelinski et al., 2002
[7] BOEM, 2014
[8] Leaper, 2019; Pine et al., 2018; McKenna et al., 2013

- **Marine Mammals:** As described in Section 4.6.5.9., potential exposure of marine mammals to vessels used during the construction phase is considered very low due to the high seasonality of marine mammals present in the Project Area and the habituation of marine mammals to vessel traffic in Mount Hope Bay. There is a possibility that marine mammals may alter their behavior while in close proximity to vessels, but this avoidance behavior is expected to decrease vessel collision risk and isn't expected to significantly affect marine mammals in the Project Area. Project mitigation measures designed to reduce or eliminate vessel strikes with marine species will be implemented to further reduce potential effects of increased vessel traffic.

4.7 COST ANALYSIS

A variety of factors were considered in the cost assessment of these routes, including:

- Route Length: Route length is directly related to cost, since certain fixed costs (e.g., cost of cable supply and installation) are determined by length. Lengths of onshore routes as well as the incremental difference in lengths of offshore routes are factored into this analysis.
- Easements: Routing on private property requires close coordination with landowners and other existing easement holders to balance their priorities in conjunction with the needs of the Project.
- Surface Cover: Although most of the potential onshore routes are within previously altered and disturbed areas on Brayton Point that were used for the Brayton Point Power Station, a small stretch of the Noticed Alternative Route is located within a paved, town roadway, so construction costs differ somewhat between the two. The difference is driven by pavement restoration, loam and seed, and traffic control costs for commercial activities at Brayton Point.
- Existing Subsurface Utility Density: The number of existing utilities in the roadway can determine the available lateral and below-grade space to physically accommodate an underground export cable. Increased utility density can complicate the construction process, resulting in greater costs.

Mayflower Wind has sought to minimize costs where feasible, consistent with other considerations, such as constructability and minimizing environmental impact. Attachment G provides a confidential cost comparison between the onshore Preferred Route and Noticed Alternative. Due to the confidential and commercially sensitive nature of Attachment G, Mayflower Wind has filed it under seal with the Siting Board and has filed a motion for protective treatment of the information. The comparative cost analysis incorporates the above-described factors. The route with the most favorable cost is the Preferred Route.

The Preferred Route and Noticed Alternative are directly comparable. Each route ends at the proposed HVDC converter station. Key factors that reduced the cost for the Preferred Route compared to other routes include:

- **Colocation with existing commercial activities**
  - Offshore export cables would need to be installed a minimum depth of 10 ft (3.0 m) below the bottom elevation of the existing dredged channels, introducing greater cost for the Noticed Alternative Route.
  - The Preferred Route will not impact public roadways or Brayton Point site access, while the Noticed Alternative Route will have an impact on Brayton Point Road, which serves as an access for both commercial and industrial operations located at Brayton Point. As such, construction costs would be lower for the Preferred Route.

- **Colocation with the National Grid Right of Way**
  - The Noticed Alternative route crosses the existing National Grid ROW to reach the HVDC converter station site. This crossing would introduce additional coordination and cost with respect to easements and construction requirements.

4.8 RELIABILITY ANALYSIS

Mayflower Wind evaluated reliability for the Preferred Route and Noticed Alternative Route. Onshore export cable routes to the HVDC converter station site use underground installation for both Preferred and Noticed Alternative routes. Therefore, aside from a slight difference in length, there are no reliability differences between the Preferred Route and Noticed Alternative. Increased length could increase the risk of potential faults. However, in this case route lengths are similar enough that this would not result in any significant difference in reliability.

The Noticed Alternative (eastern ECC option) presents likely higher risks to the integrity of a buried submarine cable. For example, the eastern ECC option crosses a dredged shipping channel and a dredged turning basin, neither of which are traversed by the Preferred Route (western ECC option). Additionally, the eastern ECC option crosses a greater area of mapped shallow gas accumulation than the western ECC option, potentially concealing additional buried geohazards and posing additional risk to cable performance and long-term integrity. Reducing the offshore export cables' integrity risk or exposure to other third-party impact is paramount in maintaining the reliability of the offshore export cables and by extension the reliability of the Project.

4.9 SUMMARY AND CONCLUSIONS

The route selection process undertaken by Mayflower Wind addresses the Siting Board's standards applicable to jurisdictional energy facilities in a comprehensive manner. Mayflower Wind identified various routes as potential alternatives to satisfy the Project need, and used a process designed to ensure that no clearly superior route was overlooked. Mayflower Wind systematically compared possible routes based upon reasonable criteria to evaluate the environmental impacts, cost, and reliability of the identified route alternatives. At the conclusion of this process Mayflower Wind identified a Preferred Route, a Noticed Alternative Route, and a Noticed Variation that applies to both. Mayflower Wind's selection of routes best balances environmental impacts, costs and reliability and will enable Mayflower Wind to meet the identified need.

The onshore Preferred Route will enable Mayflower Wind to achieve the best balance overall among environmental impact, cost and reliability in accordance with the Siting Board's standards and precedent. The Preferred Route is a feasible route for construction that avoids or minimizes impacts to natural and developed environments. Under the factual circumstances of a single converter station at Brayton Point, the constricted space at the site, the limited options for feasible landfall locations, and the desire to avoid environmental hazards on the site, Mayflower Wind has also selected a viable Noticed Alternative Route with geographic distinctness that provides some measure of geographic diversity in accordance with the Siting Board's standards and precedent. Mayflower Wind has selected the western offshore ECC route (Lee River approach) as the Preferred Route for the Project. As documented in Section 4.6 above, the selected route is technically feasible and environmentally more favorable than other options considered.

Section 5 compares the potential temporary and permanent impacts of the Preferred Route and Noticed Alternative Route in more detail.

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5 COMPARISON OF PREFERRED ROUTE AND NOTICED ALTERNATIVE ROUTE

As presented in Section 4 of this Analysis, Mayflower Wind selected Candidate Route 1 as the Preferred Route for the offshore and onshore transmission route. The Preferred Route approaches Brayton Point from the Lee River and makes landfall on the west side of the peninsula at Brayton Point and connects to the proposed HVDC converter station. Mayflower Wind chose this route because it provided the best balance of the applied route selection criteria, environmental impacts avoidance and minimization, and considerations of reliability and cost. Candidate Route 2 was selected as the Noticed Alternative Route. This route makes landfall on the east side of Brayton Point via the Taunton River.

As also presented in Section 4, Mayflower Wind is proposing a Noticed Variation to prudently and efficiently plan for potential future need to deliver additional clean energy at or near Brayton Point. The Noticed Variation would apply to the onshore portion of both the Preferred Route and the Noticed Alternative Route. The Noticed Variation would involve sizing underground infrastructure for the HVDC export cables to include deeper trenching and spare conduits at landfall and onshore that would be capable of accommodating an additional 1,200 MW HVDC circuit on the same routes as the Preferred Route and the Noticed Alternative Route.

This Section 5 provides a detailed analysis and comparison of the potential environmental impacts and mitigation, costs and reliability of the Preferred Route, Noticed Alternative Route, and Noticed Variation for the Project. Descriptions of the Preferred Route and Noticed Alternative Route are provided in Section 5.1. Section 5.2 provides a comparison of the potential impacts to the natural environment for the Preferred Route and Noticed Alternative Route, and Section 5.3 compares potential impacts associated with the developed environment, including community and socioeconomic impacts.

5.1 DESCRIPTION OF PREFERRED AND NOTICED ALTERNATIVE ROUTES

5.1.1 Preferred Route

The Preferred Route enters Massachusetts state waters southwest of Brayton Point in Mount Hope Bay. From here, the Preferred Route travels northeast entering the mouth of the Lee River on the west side of Brayton Point. From the Lee River, the sea-to-shore transition will utilize HDD technology to make landfall. The offshore export cables will transition to onshore export cables within TJBs southwest of the proposed onshore HVDC converter station. From the TJBs, the onshore HVDC export circuit will be routed to the north then east alongside an existing access road for approximately 0.6 mi (1.0 km) to the proposed HVDC converter station. HVAC transmission interconnection lines will then transmit the converted power to the POI at the existing National Grid Brayton Point substation, approximately 0.2 mi (0.3 km) south of the proposed converter station.

There are no known existing submarine cables that make landfall at the west side of Brayton Point. There are no direct abutting residential property owners along the western shoreline, or other existing uses of the property that would be impacted, with the onshore Preferred Route being entirely within a brownfields area formerly used for the Brayton Point Power Station operations that is not currently used.

5.1.2 Noticed Alternative Route

The Noticed Alternative Route also begins where the offshore export cables enter Massachusetts state waters in Mount Hope Bay southwest of Brayton Point. Within Mount Hope Bay, the Noticed Alternative Route diverges from the Preferred Route, travelling northeast and entering the mouth of the Taunton

River on the east side of Brayton Point. From the Taunton River, the sea-to-shore transition would utilize HDD technology to make landfall. The offshore export cables would transition to onshore export cables within TJBs southeast of the proposed onshore HVDC converter station. From the TJBs, the onshore HVDC export circuit would be routed alongside Brayton Point Road to the north then west following existing access roads and crossing the National Grid ROW for a total distance of approximately 0.4 mi (0.6 km) to the proposed HVDC converter station. HVAC transmission interconnection lines will then transmit the converted power to the POI at the existing National Grid Brayton Point substation, approximately 0.2 mi (0.3 km) south of the proposed converter station.

This Noticed Alternative landfall would require the use of Brayton Point Road for the underground HVDC cables which could have an impact on business operations associated with the Brayton Point Commerce Center. The Commerce Center also utilizes an area along the shore of the peninsula south of the proposed HDD transition location. Equipment staging and set-up for the sea-to-shore transition would potentially interfere with boat traffic and operations at the Commerce Center. The sea-to-shore transition equipment and staging operations would also be located immediately south and offshore from Brayton Point Beach and residential properties which would likely have greater visual and noise impacts during construction compared to work conducted on the west side of the peninsula. There are no known existing submarine cables that make landfall at the east side of Brayton Point, although there is a cable area charted onto the National Oceanic and Atmospheric Administration nautical charts in the general vicinity of the offshore ECC.

5.1.3 Noticed Variation

Mayflower Wind has identified a design variation to the Project, referred to as the Noticed Variation, which would involve the design and construction of certain right-sized transmission facilities along the same onshore routes to enable the delivery of an additional estimated 1,200 MW of renewable clean energy. The Noticed Variation would involve sizing underground infrastructure to include spare conduits and vaults at landfall and onshore, capable of accommodating an additional 1,200 MW HVDC circuit along the same landfall and onshore export cable routes as the Preferred Route and Noticed Alternative Route (refer to Attachment B - Preliminary Engineering Drawings).

Mayflower Wind is committed to fully developing and delivering energy from the Clean Energy Resource and believes it is prudent and efficient planning to provide for the potential that all of the energy from the Clean Energy Resource could be delivered to POIs at or near Brayton Point, pending additional study of regional grid considerations as part of the ISO-NE interconnection process. Mayflower Wind wishes to provide for this contingency to do the right thing by not only prudently planning but also avoiding/ minimizing impacts to the community and the environment. Developing the Project in this way would mean less disturbance of the natural and developed environment by conducting earthwork and civil construction onshore in a single campaign.

For the remainder of Section 5, the Noticed Variation will only be discussed when it is different from the Project.

5.2 Potential Effects on the Natural Environment

This Section 5.2 describes the environmental resources along the Preferred and Noticed Alternative Routes, presents a comparative analysis of potential impacts to specific resources due to installation of the proposed onshore underground transmission facilities, and describes the measures that Mayflower Wind has identified to mitigate such impacts.

5.2.1 Wetland Resource Areas

Figure 5-1A provides an overview of wetland resource areas in proximity to the Preferred and Noticed Alternative Routes based on Massachusetts Department of Environmental Protection wetland data (2005) and National Wetlands Inventory data (United States Fish and Wildlife Service 2008). Figure 5-1B shows field-delineated wetland resources. Field delineations were completed by POWER during the winter in December 2021. The proposed onshore transmission system and all related components will be installed underground within and beneath pre-existing disturbed areas at the former power plant in the form of roadway layouts, paved parking lots, existing access roads, or the National Grid transmission right-of-way. Work conducted within these areas will cause temporary disturbances within some wetland resource areas subject to regulation under the WPA,[1] however, it is not anticipated that the installation of the underground utilities will result in any long-term impacts to said resource areas. Accordingly, the Project as currently designed, including the Preferred Route and Noticed Alternative Route, will avoid or minimize permanent impact to wetland resource areas, as a result of the installation of the onshore underground transmission system and HVDC converter station, regardless of the route chosen.

Mayflower Wind will use HDD to transition between the offshore and onshore components of the Project to avoid impacts to coastal resource areas such as Barrier Beach, Coastal Beach, Bank, and Dune, as well as to mitigate for impacts to Land Under the Ocean. Regardless of the route chosen, the Preferred and Noticed Alternative routes are equivalent with respect to the minimal impacts to the aforementioned coastal resource areas. The offshore export cable installation, which will occur within Land Under the Ocean (as defined in 310 CMR 10.25), is discussed in Section 4.6.5.22.

An on-site wetland delineation was performed at the Brayton Point site in December 2021. The field investigation at the Brayton Point site identified coastal features such as barrier beaches, coastal dunes, coastal banks, wetland resource areas, bordering vegetated wetland, rocky shoreline, and a salt marsh. In the vicinity of the property, the field investigation identified an inland water resource. During operation of the power plant, the man-made Lower Supply Basin functioned as a reservoir for recirculating the plant's cooling water. Simultaneously, it served as an outfall control structure where a portion of the cooling water was discharged to the Lee River. During plant decommissioning, the southwestern end of the basin was closed and is no longer directly connected to tidal waters. The bank of the basin is comprised of vertical process stone and concrete walls. Accordingly, the Lower Supply Basin is considered an inland water resource and regulated pursuant to the WPA. Resource areas include Bank and Land Under Water Bodies and Waterways (as defined in 310 CMR 10.25). The HVDC converter station is not located within Chapter 91 jurisdiction.

No potentially jurisdictional vegetated wetlands or open water areas were observed or identified within the Project footprint on the Brayton Point site.

5.2.1.1 Preferred Route

The offshore export cables will be buried beneath Land Under the Ocean (LUO) resource area. For the Preferred Route, installation of the offshore export cables (and associated seabed preparation) will result in temporary impacts to approximately 10.4 ac of LUO, which also includes the area associated with the temporary HDD exit pits (for two HDDs).

The export cable landfall will land onshore within Land Subject to Coastal Storm Flowage (LSCSF) and result in approximately 1.0 ac of temporary impact (the impact incudes the temporary HDD staging and

[1] G.L. c. 131 § 40; 310 CMR 10.00 et seq.

construction area, underground TJB and a short segment of underground duct bank to house the onshore export cables). There will be no above-ground structures constructed within LSCSF and therefore no permanent impacts to storm damage prevention or flood control are expected (see Figure 5-2, and Attachment B - Preliminary Engineering Drawings). The HVDC converter station will result in the redevelopment of approximately 7.5 ac of land located within the Mount Hope Bay Designated Port Area (DPA). The existing topography within the onshore HDD staging area and along the onshore export cable route will be stabilized and restored once the installation of the underground export cable system is complete, so no permanent changes to topography or flood storage capacity will occur.

Noticed Variation

Under the Noticed Variation, two additional (spare) HDD conduits would be constructed at landfall, which would require two additional temporary HDD exit pits. Therefore, for the Noticed Variation to the Preferred Route, installation of the offshore export cables (and associated seabed preparation) will result in temporary impacts to approximately 11.0 ac of LUO, which also includes the area associated with the temporary HDD exit pits (for four HDDs).

Onshore, the Noticed Variation would fit within the same 1.0 ac of temporary impacts described above.

5.2.1.2 Noticed Alternative Route

For the Noticed Alternative Route, installation of the offshore export cables (and associated seabed preparation) will result in temporary impacts to approximately 11.9 ac of LUO, which also includes the area associated with the temporary HDD exit pits (for two HDDs).

The export cable landfall would land onshore within LSCSF and result in approximately 0.4 ac temporary impact (the impact includes a section of the temporary HDD staging area). There would be no above-ground structures constructed within LSCSF and therefore no permanent impacts to storm damage prevention or flood control are expected (see Figure 5-2, and Attachment B - Preliminary Engineering Drawings). The construction of the HVDC converter station would remain the same as the Preferred Alternative and would involve redevelopment within the Mount Hope Bay DPA. The existing topography within the onshore HDD staging area would be stabilized and restored once the installation of the underground export cable system is complete, so no permanent changes to topography or flood storage capacity would occur.

Noticed Variation

Under the Noticed Variation, two additional (spare) HDD conduits would be constructed at landfall, which would require two additional temporary HDD exit pits. Therefore, for the Noticed Variation to the Noticed Alternative, installation of the offshore export cables (and associated seabed preparation) will result in temporary impacts to approximately 12.5 ac of LUO, which also includes the area associated with the temporary HDD exit pits (for four HDDs).

Onshore, the Noticed Variation would fit within the same 0.4 ac of temporary impacts described above.

5.2.2 Comparison of Impacts and Mitigation Measures

The Preferred and Noticed Alternative Routes have been selected to avoid and/or minimize wetland impacts. Construction of the Preferred or Noticed Alternative Route to the HVDC converter station and onward to the POI will not result in any direct impacts to wetlands or waterbodies.

Both the Preferred Route and the Noticed Alternative Route will temporarily disturb LSCSF. As neither route option would have a significant permanent impact to LSCSF, they are equivalent with regard to

associated impacts. The onshore portion of the Project (from landfall to POI) is not expected to impact coastal and inland wetland resources.

A Stormwater Pollution Prevention Plan will be prepared and implemented for the Project that will specify erosion and sedimentation control measures to avoid and mitigate for impacts to wetlands or waterways outside the immediate construction limit of disturbance.

5.2.2.1 Compliance with Performance Standards under the WPA

The WPA (G.L. Chapter 131, Section 40) and its implementing regulations (310 CMR 10) protect wetlands and the public interests they serve, including flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat.

The installation of buried utilities in buffer zones and within paved roadways is defined as a "minor project."[2] Minor projects are exempt from the WPA regulations and are therefore not subject to the performance standards that would otherwise apply to projects involving work within the buffer zone. For minor Projects, the performance standards apply only to those portions of the Project that are within wetland resource areas, but not those segments that are within a Riverfront Area or the 100 ft (30 m) buffer zone of wetland resource areas. As sited and designed, the onshore Project components do not require work in state-regulated wetlands.

The Mayflower Wind Project including the Preferred Route, Noticed Alternative Route, and the Noticed Variation, will not adversely impact wetlands.

5.2.3 Rare Species

Mayflower Wind has consulted with and intends to continue consultations with the NHESP in accordance with the Massachusetts Endangered Species Act (MESA) (G.L. c. 131A) and the requirements of its implementing regulation (321 CMR 10.14). Mayflower Wind will avoid or minimize any impacts to the greatest extent practicable and is developing plans to do so. Mapped Estimated and Priority Habitat (Massachusetts Natural Heritage Atlas, 15th Edition, 2021) are illustrated relative to the onshore Project components for the Preferred and Noticed Alternative routes in Figure 4-4.

5.2.3.1 Preferred Route

There is no mapped Estimated or Priority Habitat for rare species within the Preferred Route.

5.2.3.2 Noticed Alternative

There is no mapped Estimated or Priority Habitat for rare species within the Noticed Alternative Route.

5.2.3.3 Comparison of Impacts and Mitigation Measures

The Preferred and Noticed Alternative routes are located outside of mapped Estimated or Priority Habitat, and therefore are equivalent with regard to associated impacts. The onshore Project is not expected to affect wildlife habitat.

[2] 310 CMR 10.02(b)(2)(b)(i).

5.2.3.4 Compliance with Performance Standards under the MESA

In compliance with the implementing regulations of the MESA (321 CMR 10.00), no work is expected within Priority or Estimated Habitat of rare species for either of the routes under consideration. Thus, construction of the Project is exempt from review under the MESA and no impact to rare species habitats by the Project infrastructure is anticipated.

5.2.4 Water Quality and Water Supply Protection

Mayflower Wind evaluated mapped water resources, MassDEP Zone I and II areas, and wellhead protection areas approved under MassDEP's Drinking Water Program. Freshwater Recharge Areas (FWRA) were also evaluated and found that there are no FWRAs located within the Brayton Point onshore export cable route options.

For the reasons explained below, the Project is not expected to result in any significant impacts to water resources along the onshore Preferred and Noticed Alternative routes.

5.2.4.1 Preferred Route

The onshore Preferred Route, including the construction of the Mayflower Wind HVDC converter station at the Brayton Point site, does not include work within MassDEP Zone I and II areas, wellhead protection areas, or Potential Public Water Supplies. There are no Zone I or Zone II Wellhead Protection Areas in the immediate vicinity of the Brayton Point landfall sites. The underground transmission route from the HVDC converter station to the POI does not pass through any MassDEP Zone I and II areas, wellhead protection areas, FWRAs, or Potential Public Water Supplies. The onshore Project area does not cross through any areas designated as drinking water or FWRAs (see Figure 5-3).

5.2.4.2 Noticed Alternative

The Noticed Alternative onshore export cable route does not include work within MassDEP Zone I and II areas, wellhead protection areas or Potential Public Water Supplies. As mentioned above, the underground transmission route from the HVDC converter station to the POI does not pass through any MassDEP Zone I and II areas, wellhead protection areas, FWRAs, or Potential Public Water Supplies (see Figure 5-3).

5.2.4.3 Comparison of Impacts and Mitigation Measures

The Preferred Route and Noticed Alternative Routes do not include work within MassDEP Zone I and II areas, wellhead protection areas, FWRAs, or Potential Public Water Supplies. No portion of either the Preferred or Noticed Alternative Routes pass through any of the areas stated above.

Groundwater at Brayton Point has a higher level of total dissolved solids and is not recommended for drinking.[3,4] Project-related construction activities will be designed to avoid potential impacts to local groundwater and surface water resources that may occur due to soil erosion or stormwater discharge into waterbodies or contact with groundwater resources. All requirements of National Pollutant Discharge Elimination System construction permits and best management practices will be implemented to protect water resources.

The onshore export and transmission cables will be installed at the industrial site of a decommissioned power plant (Brayton Point Power Station). The use of proper erosion and sedimentation controls during

[3] MassDEP
[4] MassGIS 2021

construction will mitigate potential impacts to water resources during construction. Additional information regarding erosion and sedimentation controls to be utilized during construction is discussed below in Section 5.5.3. Once complete, the underground transmission system will have no impact on water quality or water supplies.

The use of proper erosion and sedimentation controls during construction will mitigate potential impacts to water resources. Additional information regarding erosion and sedimentation controls to be utilized during construction are discussed in Section 5.5.3. Upon completion of construction, there would be no Project-related sources of erosion or sedimentation.

Mayflower Wind will prepare a Spill Prevention, Control and Countermeasures Plan. Mayflower Wind will also include spill response in its emergency response plan as part of the Project's overall safety management system. Appropriate spill containment kits and spill control accessories will be strategically situated at the HVDC converter station and may include absorbent pads, temporary berms, absorbent socks, drip pans, drain covers/plugs, appropriate neutralizers, over pack containers all for immediate use in the event of any inadvertent spills or leaks. All operators will be trained in the use and deployment of such spill prevention equipment. Procedures for refueling construction equipment will ensure safety and spill prevention and will be further established during consultations with MassDEP.

Accordingly, the overall difference between the routing alternatives on the basis of water supply and water quality protection is negligible.

5.2.5 Climate Change Resiliency and Sustainability

This Project is being proposed in response to specific legislative mandates for climate change response, clean energy, and utility-scale offshore wind generation. The purpose of the Project is to deliver approximately 1,200 MW of capacity from Mayflower Wind's Clean Energy Resource to Massachusetts and the New England regional electric grid.[5] This reliable resource will significantly increase the renewable clean energy supply available to Massachusetts consumers, reduce carbon emissions across the region, displace electricity generated by fossil fuel-powered plants, improve energy system reliability and security, and enhance economic competitiveness by reducing energy costs, attracting new investments, and creating job growth. Sea level rise and shoreline changes associated with climate change have the potential to affect project infrastructure. Mayflower Wind has considered both sea level rise and shoreline change in the siting and design of the Project infrastructure and has designed the Project to be resilient to the impacts of climate change.

5.2.5.1 Sea Level Rise

Mayflower Wind evaluated the potential risks of sea level rise on the Project's onshore infrastructure including the TJBs onshore at landfall locations, onshore underground export cable routes (conduits and splice vaults), and HVDC converter station site. The site of the proposed HVDC converter station is located outside of the boundaries of forecasted sea level rise, inundation of coastal erosion.

Future sea level projections are provided for the Massachusetts coastline at established tide gauge stations with long-term records in Massachusetts at Boston Harbor, Nantucket, and Woods Hole; and in Rhode Island in Newport. Using the Massachusetts Climate Change Clearinghouse (resilient MA)'s

[5] Under the conditions described in connection with the Noticed Variation, the Project could be used to deliver energy from an estimated 2,400 MW from the Clean Energy Resource, subject to a separate proceeding with the Siting Board.

Climate Tool,[6] the expected sea level rise from the closest recording station, at Newport, Rhode Island is projected to rise by 2.4 ft above mean higher high water(see Section 5.4.3.1.7 below).

While 40-year shoreline erosion estimates are not available for the Mount Hope Bay area, in the vicinity of Brayton Point, the western approach to Brayton Point via the Lee River does consist of an armored coastal bank. Riprap has been placed along the berm on the western side of Brayton Point during its former use as the Brayton Point Power Station to armor, stabilize, and protect the shoreline against erosion and scour in the area where coolant water was discharged.

The Taunton River (eastern side) of Brayton Point consists of a manmade berth, turning basin and vertical bulkhead. The bulkhead is a shoreline hardening measure originally constructed to allow for large vessel berthing and to protect the area from erosion due to wave action and storm surges.

Mayflower Wind will use HDD to transition between the offshore and onshore components of the Project in order to avoid impacts to coastal resource areas such as barrier beach, coastal beach, coastal bank, and rocky intertidal shore, as well as mitigate for impacts to LUO. Avoidance of the resource areas will reduce the potential for contributing to erosion or vulnerability to erosion and shoreline retreat.

5.2.5.2 Preferred Route

The western landfall option from the Lee River and the Preferred Route onshore remains above inundation levels with a projected 4.0 ft (1.2 m) sea level rise (see Figure 5-4). Furthermore, the preferred onshore route contains only a short segment at the landfall location below the inundation levels with even the maximum 6.0 ft (1.8 m) sea level rise (Figure 5-5).

Based on the modeling of overland storm flowage, a small portion of the western landfall option and the Preferred Onshore Route would experience overland flows under Category 1 or larger hurricane conditions at current sea level conditions (Figure 5-6). The Brayton Point POI may be inundated in Category 4 or larger hurricanes. With sea level rise, overland flow associated with hurricanes would be expected to worsen (i.e., pushing further inland) and lower lying areas may experience overland flow with lesser storm intensity.

5.2.5.3 Noticed Alternative Route

The eastern landfall option from the Taunton River and the Noticed Alternative onshore route remains above inundation levels with a projected 4.0 ft (1.2 m) sea level rise (Figure 5-4) and would remain above inundation levels even with a projected 6.0 ft (1.8 m) sea level rise (Figure 5-5).

The eastern landfall option and the Noticed Alternative Route onshore may experience overland flow under a Category 3 or larger hurricane under existing sea level conditions based on the SLOSH modeling (Figure 5-6). Inundation associated with hurricanes for the Noticed Alternative is slightly less than the inundation expected for the Preferred Route under existing sea level conditions. The HVDC converter station site is located well outside of potential inundation zones associated with hurricanes. With sea level rise, overland flow associated with hurricanes would be expected to worsen (i.e., pushing further inland) and lower lying areas may experience overland flow with lesser storm intensity.

5.2.5.4 Comparison of Impacts and Mitigation Measures

The onshore export cable routes for both the Preferred Route and Noticed Alternative Route are expected to avoid inundation at a 4.0 ft (1.2 m) sea level rise, consistent with the expected operational

[6] Resilient MA. n.d. “MA Climate Change Clearinghouse.” Resilientma.org. Accessed March 3, 2022. https://resilientma.org/rmat_home/designstandards/.

life of the Project. A short segment of the Preferred Route would experience inundation at a 6.0 ft (1.8 m) sea level rise. The same area of the Preferred Route is also at risk of overland storm flowage due to Category 1 or larger hurricanes. The Noticed Alternative Route is only at risk of overland storm flowage due to Category 3 or larger hurricanes. With sea level rise, the frequency and severity of overland storm flowage is likely to increase. Therefore, the Noticed Alternative Route may be favored over the Preferred Route in regard to sea level rise. However, the Project is being designed with climate change in mind and both options under consideration are expected to be resilient to sea level rise. All Project components at the landfall location and along the onshore route will be buried and designed for submerged conditions.

5.2.5.5 Shoreline Changes

Shoreline change is addressed and defined in the Town of Somerset Natural Hazard Mitigation Plan.[7] Shoreline change is the accretion or erosion of shoreline, resulting in a long-term net increase or decrease in land area. Shoreline change is a function of: 1) the shoreline topography and geology; 2) availability of sediment within the nearshore environment; 3) the presence of coastal structures; and 4) hydraulic factors including water level, waves, sea level rise and alongshore currents.[8] Shoreline change occurs as a result of: 1) long term environmental conditions; and 2) short term, episodic changes that occur during coastal storms.[9]

The Preferred Route and Noticed Alternative Route will require the installation of onshore infrastructure (i.e., TJBs with manholes) at the respective landfall sites where the offshore export cables will transition to onshore export cables. To ensure that proposed onshore infrastructure associated with the Project will not cause or be vulnerable to shoreline erosion or shoreline retreat, Mayflower Wind has located the proposed infrastructure in upland areas a significant distance from the current mean higher high water line, and has chosen a construction method (HDD) that will not directly impact coastal resource areas and shorelines. Figure 5-2 illustrates those portions of the Preferred and Noticed Alternative routes that fall within mapped flood zones.

The Massachusetts Office of CZM established an agreement with the USGS, the Woods Hole Oceanographic Institution Sea Grant Program, and the Cape Cod Cooperative Extension to produce the 1994 shoreline and calculate shoreline change rates.[10] However, this shoreline change analysis is currently only performed for the ocean-facing shorelines of Massachusetts.[11] Also, no information was included for Somerset as a part of the Massachusetts Coastal Erosion Commission's December 2015 Report of the Massachusetts Coastal Erosion Commission.[12] Therefore, documented shoreline changes data and data to develop quantitative estimates of future shoreline change for Somerset are not currently available. Compared to alternative ocean-facing locations, the Brayton Point site is likely at lower risk of long-term shoreline change.

The Brayton Point site is located within the Mount Hope Bay DPA.[13] A DPA is "an area of contiguous lands and waters in the coastal zone that have been designated by CZM in accordance with 301 CMR 25.00." Land under the ocean in a DPA is regulated differently than land under the ocean outside of DPAs due to certain criteria that accommodate water-dependent industrial uses. One criterion is

[7] GZA GeoEnvironmental, Inc. "Town of Somerset Natural Hazard Mitigation Plan." townofsomerset.org. Town of Somerset, Massachusetts Planning Department, November 7, 2018. https://www.townofsomerset.org/sites/g/files/vyhlif3821/f/uploads/somerset_ma_natural_hazard_mitigation_plan_11-07-2018.pdf.
[8] GZA GeoEnvironmental, Inc. Natural Hazard Mitigation Plan, 2-39.
[9] GZA GeoEnvironmental, Inc. Natural Hazard Mitigation Plan, 2-39.
[10] GZA GeoEnvironmental, Inc. Natural Hazard Mitigation Plan, 2-39.
[11] GZA GeoEnvironmental, Inc. Natural Hazard Mitigation Plan, 2-39.
[12] GZA GeoEnvironmental, Inc. Natural Hazard Mitigation Plan, 2-39.
[13] "301 CMR 25: Designation of Port Areas." Mass.gov. Massachusetts Executive Office of Energy and Environmental Affairs, March 10, 2017. https://www.mass.gov/regulations/301-CMR-25-designation-of-port-areas.

shoreline that has been substantially developed with piers, wharves, bulkheads, or other structures that establish a functional connection with a water area.[14] Landforms in DPAs are greatly altered from their natural shape using coastal engineering to protect port resources and upland areas from storm damage and flooding and to accommodate industrial uses. Engineered features in DPAs provide support for adjacent coastal uses through storm damage prevention and food control. Specific engineered structures at Brayton Point are described below for the Preferred and Noticed Alternative Routes.

5.2.5.6 Preferred Route

The Lee River western landfall is partially located within mapped FEMA Flood Insurance Rate Map 100-year floodplain boundaries at Brayton Point consists of two flood zones, the first consisting of Zone VE, which is defined as coastal flood zone with velocity hazard and wave action, and the base flood elevation is determine at elevation 18 feet (5.5 m). The second flood is Zone AE, which is the limits of the 100-year flood zone, base flood elevation determined at elevation 15 ft (4.5 m), (Figure 5-2). The coastal boundaries of the 100-year floodplain, including the VE and AE zones define the boundaries of LSCSF wetland resource area.

A portion of the HDD staging area will temporarily disturb approximately 1.0 ac of LSCSF. However, the TJB and duct bank will be installed underground and will not displace flood volume or interfere with the LSCSF performance standards of storm damage prevention and flood control.

5.2.5.7 Noticed Alternative

The Taunton River eastern landfall site is partially located within LSCSF mapped on the eastern side of Brayton Point (Figure 5-2). A portion of the HDD staging area will temporarily disturb approximately 0.4 ac of LSCSF. However, the TJB and duct bank will be installed outside of the limits of the LSCSF elevation and therefore will not interfere with the LSCSF performance standards of storm damage prevention and flood control.

5.2.5.8 Comparison of Impacts and Mitigation Measures

The landfall locations for the Preferred and Noticed Alternative Routes have been selected to avoid or minimize impacts to coastal resources that may cause or exacerbate coastal erosion and/or avoid and mitigate risks to the infrastructure associated with flooding and erosion. All Project components at the landfall location and along the onshore transmission route will be buried and conservatively designed for submerged conditions. Based on the analysis above, the landfall locations for the Preferred Route and Noticed Alternative Route are not at risk relative to potential shoreline changes. The Noticed Alternative Route is located in an area at lower risk for flooding. The Preferred Landfall is located in FEMA velocity Zone (Zone VE) subject to inundation by the one percent annual chance flood event with potential hazards due to storm-induced velocity wave action. Engineered coastal features such as the berm with riprap, bulkhead, wharf, and marine terminal provide additional protection from erosion. Additionally, because all Project facilities within the mapped flood plains will be subsurface, there is no material difference between the Preferred Route and Noticed Alternative in regard to shoreline changes.

5.2.6 Tree Clearing

As the Project is located in a previously disturbed, industrial area at Brayton Point, no tree clearing nor any significant removal of vegetation is anticipated for the Project.

[14] 301 CMR 25

5.2.6.1 Comparison of Impacts and Mitigation Measures

No tree clearing is anticipated for the Preferred Route or the Noticed Alternative Route, and therefore they are equivalent with regard to associated impacts. Only minimal herbaceous vegetation (i.e., grass) is expected to be disturbed by the Project. Any disturbed vegetation will be restored (reseeded and stabilized) as soon as feasible following final grading to support stormwater management.

5.3 Potential Effects on the Developed Environment

Various social (built environment) considerations used in the evaluation for candidate routes are presented below to provide a direct comparison of the Preferred Route and Noticed Alternative Route.

5.3.1 Traffic Management

As noted previously, the onshore export cables will be constructed within industrial property privately under the operation of the Brayton Point Commerce Center. Brayton Point is a former power station and consists of pre-existing disturbed areas. The Brayton Point landfall locations, western (Preferred) and eastern (Noticed Alternative) are also both located at the Brayton Point Power Station site. The HVDC converter station and onshore export cables will be constructed within these disturbed areas, such as paved parking lots, concrete pads, previously disturbed areas, and along exiting, interior access roads.

The former Brayton Point Power Station property abuts a Massachusetts Department of Transportation (MassDOT) State Highway Layout of Interstate Route 195 to the north of the site. According to MassDOT's standard operating procedures, vehicular access permits are required for construction of new, or change in use of existing, residential or commercial driveway from properties that abut the State Highway Layout to serve a building or facility, or expansion of a building or facility, that generates a "Substantial Increase in or Impact on Traffic," which is defined, in part, as "a project that results in creation of a change in the type, pattern, or timing of traffic that is determined by MassHighway to generate a significant impact on traffic flow and safety." While the Project does not appear to require a MassDOT access permit, Mayflower Wind will consult with MassDOT to confirm this assessment.

Mayflower Wind does not foresee any significant impact to state or local roadways that would cause traffic restrictions, road closures or congestion. A traffic management plan may potentially be needed for delivery of oversized loads down Brayton Point Road during construction. Despite the low impact, Mayflower Wind will have a construction schedule webpage to alert abutters, residents and other stakeholders of construction traffic control measures if necessary. During operations, the converter station will generally be unmanned, with personnel on site periodically for inspections, maintenance, and repairs.

5.3.1.1 Preferred Route

The Preferred Route will align with the existing outer perimeter road at the Brayton Point site. Use of this perimeter road will significantly reduce potential impacts to the movement of vehicles and other traffic that may be generated within the interior of the Brayton Point facility.

5.3.1.2 Noticed Alternative Route

The Noticed Alternative Route would make landfall at Brayton Point from the Taunton River. The Noticed Alternative Route would be aligned with the southern end of Brayton Point Road and then follow existing access roads within the interior of the Brayton Point facility. The landfall location of the Noticed Alternative Route is located on the Taunton River (eastern side) of Brayton Point. The HDD

would be located within an existing paved parking lot located to the immediate east of the Brayton Point Commerce Center security entrance and guard station. The onshore export cable route would predominantly follow the network of existing roads located on the Brayton Point site to the connection with the HVDC converter station.

The Noticed Alternative Route is less favorable than the Preferred Route, because the parking lot is located adjacent to a major trucking route on the Brayton Point property and could interfere with ongoing operations at the site. The export cable route would also need to cross the main access road onto the Brayton Point property likely creating access and egress restrictions. The export cable route would be routed around the National Grid existing 115-kV AIS substation and cross through National Grid's overhead transmission line ROW, which is occupied by four 115-kV transmission lines and structures, and two 345-kV transmission lines and transmission structures. Utility crossing agreements would need to be reached with National Grid to allow these crossings of their assets. The Noticed Alternative Route would also cause likely conflicts with National Grid's access to the entrances of their 115-kV AIS and 345-kV GIS substations.

5.3.1.3 Comparison of Impacts/Mitigation Measures

The Preferred Route and the HVDC converter station are contained within private property at Brayton Point, which minimizes the potential for traffic disruption on public roadways. For a short distance of approximately 300 ft (90 m), the Noticed Alternative route leaves private property and runs along the dead end of Brayton Point Road; however, construction activities on this stretch of road would impact Brayton Point Commerce Center activities, not the general public. The onshore export cables will be installed within a common trench in previously developed areas, predominantly along existing access roads within the interior of the Brayton Point site.

The Preferred Route and Noticed Alternative Route are located at the terminus of Brayton Point Road. The onshore segment of the export cable would be constructed underground along existing access roads interior to the Brayton Point site, and therefore significant traffic impacts to the local community are not anticipated. Delivery of over-sized loads, steel members and concrete will be coordinated by Mayflower Wind with the Town of Somerset DPW, Police Department, and MassDOT, as necessary.

The Noticed Alternative Route could cause traffic impacts and restrict access for ongoing operations at the Brayton Point Commerce Center site. Further, construction of the Noticed Alternative Route could cause access restrictions to access the existing National Grid substation facilities located at Brayton Point. The Preferred Route is considered the superior route in terms of potential impacts to traffic and traffic congestion.

5.3.2 Historic and Archaeological Resources

The Project requires federal and state approvals and is subject to review under Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 306108), and its implementing regulations (36 C.F.R. 800), and by the MHC under Massachusetts G.L. Chapter 9, Sections 26–27C (950 CMR 70–71).

Early pre-federal Section 106 consultation with the MHC and the Tribal Historic Preservation Officers was initiated after Mayflower Wind filed, on July 26, 2021, a Project Notification Form with the MHC for the Brayton Point interconnection project containing a preliminary Project description, general schedule, and recommended cultural resource studies.

The Public Archaeology Laboratory Inc. conducted a field assessment for a Terrestrial Archaeological Resources Assessment for the proposed Brayton Point HVDC converter station onshore component of the Mayflower Wind Project, on behalf of Mayflower Wind. The site examination was conducted in

accordance with the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (48 Federal Register 44716, September 29, 1983) and the MHC's (1979) Public Planning and Environmental Review: Archaeology and Historic Preservation.

Public Archaeology Laboratory Inc. conducted the terrestrial archaeological resources assessment (TARA) to determine if historic properties (archaeological sites, historic structures and districts, cemeteries, etc.) are contained within the Brayton Point converter station work area and to evaluate the potential for undiscovered archaeological sites to be within the Project Area of Potential Effects (APE). For purposes of the terrestrial archaeological resources assessment, Mayflower Wind has defined the Project APE as the site of the former coal-fired Brayton Point Power Station south of Interstate 195 and west of Brayton Point Road in Somerset. The APE therefore captures both the Preferred Route and Noticed Alternative Route, and the findings of the TARA are described together in the below section.

5.3.2.1 Preferred Route and Noticed Alternative Route

The inventory of reported archaeological sites and historic resources at Brayton Point suggests periodic Native American occupation and use of Somerset's larger Sewammock Neck area for resource exploitation and camping. Reported archaeological sites are primarily along the Lee and Taunton River shores, on salt marsh margins, or along inland drainage channels. This pattern is consistent with regional cultural models that predict that pre-contact archaeological sites would be found most often in areas of high resource diversity that include river and wetland margins and coastal/estuarine settings.

Despite environmental and cultural-historical information that suggests intensive Pre-Contact (and perhaps Contact Period) settlement of the area, only a few archaeological sites are recorded on Brayton Point because of the extensive mid-twentieth and early twenty-first century development. Small pockets of natural soils with truncated remnant features may exist as isolates in areas where nineteenth-century agricultural tilling and twentieth-century disturbances from development is less than 3 ft (0.9 m) below the pre-development land surface. However, due to the extensive disturbance, if any isolated materials are present, they would not be eligible for listing in the National/State Registers.

5.3.2.2 Comparison of Impacts/Mitigation Measures

Historical maps and aerial imagery document substantial development in the Project area since the mid-twentieth century that includes canal excavation and infilling, power generation facilities improvements and demolition, and environmental management (landfill burial) of waste coal ash. Although pre-contact and post-contact archaeological sites have been recorded on Brayton Point and the adjacent area, significant disturbance from previous construction has occurred.

Brayton Point is in an area that was once attractive for pre-contact and post-contact Native American settlement; nineteenth-century railroad construction and rail dismantlement; and twentieth- and twenty-first century construction, demolition, cutting and filling for a channel or canal, utilities installation and burial, and the disposition of waste material generated from the coal-firing operations in capped landfills. These ground disturbances have significantly altered the original landscape and disturbed or destroyed any archaeological materials that may once have been present.

Accordingly, the archaeological sensitivity of the Brayton Point HVDC converter station APE that includes the converter station, underground export HVDC cables, underground HVAC transmission facilities and alternative HDDs is not sensitive. The construction of these facilities will not impact significant historic properties eligible to the National/State Registers of Historic Places. Should any unidentified archaeological sites be encountered during construction, Mayflower Wind would halt the work task and have a qualified archaeologist assess the find including following the MHC *Procedures for Guiding the Unanticipated Discovery of Cultural Resources and Human Remains*.

The export cable corridor that aligns with the Noticed Alternative Route is in proximity to the Borden Flats Light Station which was added to the National Register of Historic Places in 1987. The export cable corridor for the Preferred Route does not approach the Borden Flats Light Station. During installation of the offshore export cables, should an unrecorded shipwreck or other suspected archaeological resources be uncovered, Mayflower Wind would halt the work in the immediate area and implement the MA BUAR *Policy Guidance for the Discovery of Unanticipated Underwater Archaeological Resources*.

5.3.3 Open Space, Conservation, and Recreational Lands

The availability of high-quality recreation and open spaces is important to the people of Somerset as well as visitors. Mayflower Wind's route options follow existing roadways within the previously disturbed private property and industrially zoned Brayton Point site. The onshore Project area does not cross any municipal-owned conservation lands in the Town of Somerset.

5.3.3.1 Preferred Route

Figure 5-7 illustrates protected and recreational open space for the Preferred Route. The offshore export cable landfall for the Preferred Route is sited within Brayton Point private property and does not include Article 97 land. The landfall location is an existing, previously developed area associated with the former Brayton Point Power Station, thus does not cross or occur within open space, conservation, or recreational lands and hence will not affect open space, conservation, or recreational lands.

5.3.3.2 Noticed Alternative Route

Figure 5-7 illustrates protected open space including Article 97 lands in the Study Area for the Noticed Alternative Route. The Noticed Alternative Route itself would not cross, and would not result in any loss of, Article 97 lands. The landfall for the Noticed Alternative Route is sited within Brayton Point private property. One Article 97 parcel is located within the 1,000 ft Study Area for the Noticed Alternative landfall; namely, the Brayton Point Wildlife Management Area (and portion of Brayton Point Beach) which is owned by the Massachusetts Department of Fish and Game. Although the route does not directly cross this area, it is located within the 1,000 ft Study Area, which is defined as an area buffered by 500 ft to either side of the onshore export cable route and 500 feet from the boundary of the HVDC converter station.

5.3.3.3 Comparison of Impacts/Mitigation Measures

The Preferred Route option does not cross or occur within open space, conservation, or recreational lands. The Noticed Alternative route includes the installation of the underground export cable within the 500-ft buffer area of the Brayton Point Wildlife Management Area. As such, the Preferred Route is superior to the Noticed Alternative Route on the basis that there is no open space or Article 97 land within the 500-ft buffer area.

5.3.4 Sensitive Land Uses

All potential impacts to sensitive land use from the Project would be limited to the period of active construction, and upon the completion of construction, the operational phase of the Project would have no impacts to sensitive receptors. The discussion of sensitive receptors below is focused on construction-related issues of maintaining access and minimizing disturbance to uses such as hospitals, schools, police and fire stations, elder care facilities, cemeteries, daycares, district courts, and religious facilities.

Land uses at Brayton Point are shown in Figure 5-8. Brayton Point consists of industrial land use. No sensitive land uses are located adjacent to the Preferred Route or Noticed Alternative Route substation locations, and the Project will have no post-construction impacts to any sensitive receptors.

5.3.4.1 Preferred Route

Sensitive receptors near Brayton Point are shown on Figure 1-7. The nearest sensitive receptor to the Preferred Route is the Wilbur School in Somerset, which is approximately 0.55 mi to the northeast. The Preferred Route does not pass any parcels associated with sensitive receptors.

5.3.4.2 Noticed Alternative

Sensitive receptors near Brayton Point are shown on Figure 1-7. The nearest sensitive receptor to the Noticed Alternative route is the Wilbur School in Somerset, which is approximately 0.90 mi from the Noticed Alternative landfall location. The Noticed Alternative Route does not pass any parcels associated with sensitive receptors.

5.3.4.3 Comparison of Impacts/Mitigation Measures

In summary, the Preferred Route and Noticed Alternative Route do not pass through any sensitive receptors. The aforementioned sensitive receptor is not located adjacent to the proposed HVDC converter station location, and the Project would have no construction or post-construction impacts to the sensitive receptor. As discussed above, all impacts would be limited to the construction period when deliveries of oversized loads could potentially disrupt traffic in the vicinity of Brayton Point for a relatively brief period of time. Construction-period traffic issues are addressed in Section 5.3.1. As described in said section, appropriate traffic management measures will be used to maintain traffic flow, and traffic management would be coordinated with Town officials, if needed. No sensitive receptors will be affected during the construction of the Project. As such, the Preferred Route, and the Noticed Alternative Route, are equivalent regarding their lack of impact to sensitive land uses.

5.3.5 Visual Impact

Onshore export cable or transmission cable installation along Mayflower Wind's proposed routes would be underground, and as such would not result in visual impacts to the community. The only at-grade features for these underground cables would be manhole covers for access to the TJBs and splice vaults. Because onshore export cable and transmission cables would be constructed largely along existing access roads or previously disturbed/developed areas, significant vegetation clearing for the construction of those cables is not anticipated.

The proposed HVDC converter station for the Preferred Route and Noticed Alternative Route would contain above grade features such as lightning protection masts (approximately 85 ft [26 m] tall) which rise above screening topography or vegetation from some viewpoints. As such, a visual impact assessment was performed.

Tetra Tech, Inc. was retained by Mayflower Wind to prepare a Visual Report for the proposed onshore facilities at Brayton Point (Attachment H). Assessments of visual resources are required to support BOEM's National Environmental Policy Act review process for an offshore wind energy project. BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan* (2020) indicate that the visual resource assessment should apply appropriate viewshed mapping, photographic simulations, and field inventory techniques to determine, with reasonable accuracy, the visibility of the proposed Project to sensitive and scenic viewpoints. BOEM's latest methodology for the assessment of coastal character impacts, the *Assessment of Seascape, Landscape, and Visual Impacts for the Outer Continental*

Shelf of the United States,[15] was also applied insofar as the Project could affect landscape areas surrounding it.

Activities proposed under the COP filed with BOEM and all potential future phases of development have the potential to affect historic properties—those properties included in or eligible for inclusion in National Register of Historic Places—under Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and the implementing regulations at 36 C.F.R. 800. Additionally, the Project has the potential to affect properties designated as National Historic Landmarks, which requires compliance with Section 110(f) of the National Historic Preservation Act.

To define the area of potential visual impact associated with the components of the Brayton Point Onshore Project Area, the Area of Potential Visual Impact (APVI) was set as the area within 3.0 mi (4.8 km) of the converter station. The 3.0-mi (4.8-km) APVI is a conservative study area for converter station facilities, based on human visual acuity thresholds, and encompasses the area in which the Brayton Point Onshore Project Area could potentially affect visual resources. This APVI covers 26.2 square miles (67.9 square kilometers) within Bristol County Massachusetts and 5.2 square miles (13.5 square kilometers) of Warren, Rhode Island. Within the APVI, the landscape was characterized; visually sensitive resources of national, regional, state, and local significance identified; and potential Brayton Point Onshore Project Area components visibility assessed. It should be noted that the APVI represents an inventory area established for the purpose of identifying all potentially affected visual resources. The APVI captures both the Preferred Route and Noticed Alternative Route encompassing the HVDC converter station site, and therefore the visual impact assessment observations are described together in the below section.

5.3.5.1 Preferred Route and Noticed Alternative Route

The overall landscape within the APVI can be categorized as low elevation (200 ft [60 m] and lower), fairly level terrain characterized by its irregular coastline of bays, islands, and peninsulas. Much of the APVI is residential of varying types, from rural areas to dense historic urban centers. According to the USGS, the APVI is part of the Narragansett/Bristol Lowland, which occupies the largest estuary system in New England, and also maintains some of the most diverse forest types in New England.[16]

Viewshed analyses were conducted in Esri's ArcMap software to assess the potential visibility of the Brayton Point onshore Project area within the APVI. In addition to topography, the viewshed analyses for this study also utilized publicly available light detection and ranging data from the USGS to account for effects on visibility from structures and development. The results of the viewshed analyses were used to determine the extent to which the Brayton Point onshore Project area would potentially be visible from visually sensitive resources or other areas identified within the APVI. Field visits were then conducted to verify visibility of the Project from the sensitive viewpoints located in areas identified within the resulting viewshed.

5.3.5.2 Comparison of Impacts and Mitigation Measures

The view of the Project components at Brayton Point from the surrounding landscape is constrained by multiple factors. The Project's isolated location on the Brayton Point peninsula physically separates the onshore Project area from other land uses and viewpoints. Topographic features also constrain visibility (a tall earthen berm stretches approximately 500 ft (150 m) along the eastern edge of the onshore Project area, and screening vegetation exists between the onshore project area and nearby development).

[15] (Sullivan 2021)
[16] Griffith et al. 2009

Consequently, the onshore Project area would not be visible from most of the surrounding landscape. The viewshed analysis demonstrates that the Brayton Point onshore Project Area features would be screened from view for 83.96 percent of the APVI, and the vast majority of the visible portion is from the open water of Mount Hope Bay. The onshore Project area features would be screened to such a degree it would be practically indiscernible to even highly engaged viewers. Based on the photo simulations (Attachment H), topography, dense woodland, and existing development screen views of the onshore Project area features from the east, and riparian vegetation and distance screen the onshore Project area features from the west. Only the tallest portions of the onshore Project area features would be seen: the lightning protection masts (approximately 85 ft [26 m] tall) rise above screening topography or vegetation from some viewpoints. Buildings (approximately 65 ft [20 m]) would be screened. The small portion of lightning mast that is visible is seen from a distance - varying from 0.44 to 0.82 mi (0.7 to 1.3 km) - alongside existing industrial infrastructure on Brayton Point, including a large concrete storage tank, an existing tower and the existing 50-ft concrete sound wall that encompassed the now razed two 500-ft concrete cooling towers.

The results of the visual impact assessment found a minimal impact. Therefore, mitigation measures to reduce visual impacts are not strictly required. However, Mayflower Wind plans to take the following actions, to the extent practicable, to further diminish the small portion of the onshore Project area that will be visible:

- Use hot dipped galvanized exterior steelwork, which oxidizes to a neutral color/takes on the color of the sky. This is common for utility substations.
- Design buildings to blend in and consider local aesthetics; minimal elements. Select a single, non-reflective color/surface coating to reduce contrast.
- Locate several converter station components inside the building(s) to minimize outdoor features and reduce the quantity of lightning masts.
- Minimize yard features and parking area, as it is an unmanned facility. Prioritize storage of spares within an indoor area or at a separate site, to the extent feasible.
- Construct the Project facility lightning protection masts at the minimum height and diameter required for safety and function.
- Utilize non-reflective materials and colors on Project features, including the tallest elements, converter station lightning masts.

5.3.6 Noise

Mayflower Wind has assessed potential effects of noise during construction and operation on sensitive receptors adjacent to the related construction work or operating facility. Sensitive receptors associated with this Project may include residential properties and recreational areas adjacent to the export cable/transmission routes, HDD landfall locations and/or HVDC converter station. Construction-related noise is addressed in Section 5.3.6.1. Noise associated with the operation of the proposed Mayflower Wind HVDC converter station is addressed in Sections 5.3.6.2.

Mayflower Wind retained POWER Engineers, Inc. (POWER) to analyze the noise from the construction of the proposed Brayton Point HVDC converter station in Somerset, Massachusetts and additional construction of underground and submarine export cables and transmission lines into Brayton Point to ensure the installation and operation complies with the applicable noise ordinances, as detailed in the Construction Noise Report (Attachment I).

5.3.6.1 Construction Noise

The onshore export cables and transmission lines are not anticipated to generate noise during operation; consequently, noise impacts associated with the onshore cables will be limited to the construction period.

Onshore cable construction will follow the sequence outlined in Section 5.5.3. The potential for noise impacts from construction activities during the Project depends on the construction equipment used for the phases of construction and the hours of operation. The noise levels are anticipated to be sporadic and of limited duration on a given day. Noise levels decrease as the distance from the source increases.

The amount of noise generated during the construction of the Preferred and Noticed Alternative Routes is likely to vary based on factors such as the density of existing and subsurface materials encountered during trenching operations. These factors may not only require louder equipment to construct the route but may decrease the speed of the overall construction, thereby increasing the length of time that noise is encountered in front of a particular business or residence.

The use of HDD technology introduces an additional construction sound source at the HDD landfall site which is atypical of conventional construction equipment. Mayflower Wind completed a sound study to evaluate the potential sound level at the closest sensitive receptor to the work area, and where appropriate, identified mitigation measures (see Attachment I).

The nearest residence to the overall construction Project is located approximately 680 ft (207 m) away and is located in proximity to the Noticed Alternative Route. Table 5-1 identifies the types of equipment to be used for each activity during the construction sequence and provides a range of typical sound levels from the equipment. The typical sound levels were calculated at a distance of 50 ft (15.2 m) from the source and have also been calculated for noise levels at the nearest residential building to provide a conservative estimate of the typical distance from work areas to residences.

Noise is assumed to be generated by a number of pieces of equipment at various locations at the Project site for each phase of construction. As shown in Table 5-1, the noise impacts from construction activities depends on the construction equipment used for each phase of construction and the specific construction activity. These levels range from 70 A-weighed decibels (dBA) to 135 dBA at a distance of 50 ft from the construction activity. The closest residence to the Noticed Alternative Route HDD site is approximately 1,345 ft away, and the nearest residence to the Preferred Route HDD site is approximately 1,660 ft away.

TABLE 5-1. CONSTRUCTION SOUND LEVELS BEFORE MITIGATION[a]

Description of Activity	Type of Equipment	Typical Sound Levels at 50 Feet for a Single Piece of Equipment (dBA)	Estimated Sound Levels (dBA) at Closest Residence[b]
HDD Process at Taunton River East (alternate landfall)	• Generator • Power Plant • Drill Rig • Trash Pump • Excavator • Crane	93 to 135	64 to 107
HDD Process at Lee River West (preferred landfall)	• Generator • Power Plant • Drill Rig • Trash Pump	93 to 135	62 to 104

Description of Activity	Type of Equipment	Typical Sound Levels at 50 Feet for a Single Piece of Equipment (dBA)	Estimated Sound Levels (dBA) at Closest Residence[b]
	• Excavator • Crane		
Installation of HVDC Equipment, Delivery, Wall, Foundations, Conduit and Structures	• Backhoes and excavators • Rock drills mounted on excavators • Cluster drills with truck mounted compressors • Concrete trucks • Cranes • Aerial lift equipment • Tractor trailers • Dump Truck • Flatbed trucks • Bucket trucks • Generator	70 to 95	57 to 75
Energization and Commissioning	• Utility Trucks • Bucket Trucks • Generator • Aerial Lift equipment	55 to 85	35 to 65
Erosion/Sediment Controls and Road Improvements and Maintenance	• Dump trucks • Bulldozers, excavators, backhoes • Graders • Forwarders • 10-wheel trucks with grapples • Cranes	70 to 98	50 to 78
Installation of Foundations and Structures	• Backhoes and excavators • Rock drills mounted on excavators • Cluster drills with truck mounted compressors • Concrete trucks • Cranes • Aerial lift equipment • Tractor trailers	70 to 94	50 to 74
Underground Wire Installation	• Puller-tensioners	70 to 94	50 to 74

Description of Activity	Type of Equipment	Typical Sound Levels at 50 Feet for a Single Piece of Equipment (dBA)	Estimated Sound Levels (dBA) at Closest Residence[b]
	• Conductor reel stands • Cranes • Bucket trucks • Flatbed trucks • Drill rig trucks • Rock drill • Jackhammer		
Site Restoration	• Bulldozers • Excavators • Tractor-mounted York rakes • Straw blowers • Hydro-seeders • Vibratory Concrete Mixer	70 to 95	50 to 75

[a] Values above 130 dBA exceed the threshold of discomfort
Source: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm
HDD noise levels provided by Mayflower Wind
[b] Estimated sound levels calculated at an attenuation rate of 6 dB per doubling of distance

5.3.6.1.1 Mitigation Measures

The construction of the Project will include baseline ambient sound levels measured and equipment noise levels expected in the areas of construction. To the extent practical for the Preferred and Noticed Alternative Routes, construction will comply with the noise ordinances in Somerset, the Massachusetts municipality within which the Project is proposed, and the MassDEP Air Quality Regulations at 310 CMR 7.10, particularly subsections (1) and (2), which pertain to the use of sound-emitting equipment in a considerate manner so as to reduce unnecessary noise. There are no quantitative noise level limits for temporary construction in the MassDEP noise policy. Noise sources that may operate continually during the day, such as generators or air compressors, will be located away from populated areas to the best extent possible. In some instances, and as dictated by state or the local authority, construction may need to be performed at night to minimize daytime impacts to marine navigation and shipping. Some construction-related activities, such as HDD drilling, will need to be continuous efforts that occur throughout the day and night.

The potential noise impact of this Project is dependent on the final HDD location. The proposed drill location at the Lee River western approach (Preferred Route) will produce a maximum estimated unmitigated noise level of 104 dBA at the nearest residence assuming the HDD equipment is operated at continuous full load. The proposed drill location at the Taunton River eastern approach (Noticed Alternative Route) will produce a maximum estimated unmitigated noise level of 107 dBA at the nearest residence assuming the HDD equipment is operated at continuous full load. Permit applications will be filed by Mayflower Wind with the Town on Somerset, as needed, to perform construction work overnight.

Mayflower Wind intends to employ measures to reduce construction noise. These measures may include temporary noise barriers and equipment silencers to be used at all HDD locations. During

construction, Mayflower Wind will require that the contractor(s) comply with the Somerset noise ordinance. Mayflower Wind will mitigate construction noise by:

- Requiring all construction equipment to be operated such that construction-related noise levels will comply with applicable sections of the MassDEP Air Quality Regulations at 310 CMR 7.10.
- Requiring well-maintained equipment with functioning mufflers.
- Requiring muffling enclosures on continuously operating equipment such as air compressors and welding generators.
- Using a low-noise generator to reduce noise impacts for cable pulling and splicing.
- Requiring strict compliance with the Massachusetts Anti-Idling Law to prevent equipment from idling and producing unnecessary noise while not in productive use.
- If applicable, mitigating the impact of noisy equipment on sensitive locations by using shielding or buffering distance to the extent practicable.

5.3.6.2 HVDC Converter Station Operational Noise

Mayflower Wind completed an in-air acoustic assessment to evaluate potential operational noise impact on sensitive receptors and conformance with applicable regulatory requirements and guidelines. Mayflower Wind retained POWER to analyze the potential noise from the operation of the proposed Brayton Point HVDC converter station to estimate if the operation complies with the applicable noise ordinances and state regulations. The Operational Noise Report (Attachment J), prepared for the Brayton Point HVDC converter station, documents data collection efforts for ambient sound at the Preferred and Noticed Alternative construction locations and the HVDC converter station site. Ambient noise levels have been monitored at the closest representative noise-sensitive receptors to each site, to be used as the baseline for the impact analysis.

In January of 2022, POWER performed existing audible noise measurement locations in Somerset and Swansea, Massachusetts. The following sections detail the test locations, equipment, and procedures used to complete the pre-construction audible noise testing. Eight measurement locations in Somerset, Massachusetts and two locations in Swansea, Massachusetts were identified for the tests to be performed. These locations represent areas where the public has access or are in direct line with sensitive receptors in the immediate vicinity to the proposed facilities. Site selection was determined in part to reduce the effects of adjacent objects that would shield or reflect sound waves around the sound level meter.

Measurements were intentionally taken during a time when it was expected that there would be the lowest sound levels to provide the conservative measurement results. Specifically, measurements were taken during the winter, and during a time when the nearby steel scrap recycling/loading was not occurring. An independent noise field measurement report available on the Town of Somerset website[17] was reviewed by POWER for comparison. The study in Attachment J demonstrates that the measurements taken in support of this Project are conservatively low.

Figure 3 in Attachment J shows the color-shaded plot of the sound pressure levels produced by the HVDC converter station and includes the location of the ambient noise levels that were used to meet MassDEP regulations.

[17]https://www.townofsomerset.org/sites/g/files/vyhlif3821/f/pages/dust_and_noise_monitoring_results_summary_march_19-22_2020_vessel_loading_brayton_point_station.pdf

With a maximum noise level of 83 dBA at the HVDC converter station fence line, the audible noise produced by the converter station is expected to meet the MassDEP requirement of being no more than 10 dBA greater than ambient noise levels at any inhabited buildings near the property for sound produced by the facility during its 24-hour operation. The audible noise produced by the converter station is expected to be 60 dBA or less at the property line. This is below the noise level deemed reasonable by the town of Somerset for property zoned as Industrial (70 dBA) between 10:00 p.m. to 7:00 a.m. **Error! Reference source not found.** shows the projected audible noise levels at the property lines and applicable ambient measurement points. Field measurements M7 and M8 were excluded due to their locations being inside the property line.

TABLE 5-2. BRAYTON POINT AUDIBLE NOISE RESULTS

Location	Existing Ambient LEQ Noise Level (dBA)	Predicted Audible Noise Level (dBA)	Compliance Limit (dBA)
Northern Property Line	N/A*	59.8	70 (Zoned Industrial in the town of Somerset)
Eastern Property Line	N/A*	56.9	70 (Zoned Industrial in the town of Somerset)
Southern Property Line	N/A*	50.9	70 (Zoned Industrial in the town of Somerset)
Western Property Line	N/A*	48.6	70 (Zoned Industrial in the town of Somerset)
Ambient Measurement M1	62.9	56.9**	10 above ambient (MassDEP)
Ambient Measurement M2	45.3	41.3**	10 above ambient (MassDEP)
Ambient Measurement M3	44.0	41.3**	10 above ambient (MassDEP)
Ambient Measurement M4	43.7	41.3**	10 above ambient (MassDEP)
Ambient Measurement M5	41.6	47.4	10 above ambient (MassDEP)
Ambient Measurement M6	36.8	45.3	10 above ambient (MassDEP)
Ambient Measurement M9	36.6	45.3	10 above ambient (MassDEP)
Ambient Measurement M10	35.5	45.4	10 above ambient (MassDEP)

**Values listed as N/A are for existing property line levels needed to meet town regulations. For town regulation purposes, the analysis is only reporting on the predicted noise levels the HVDC converter station will have at the property lines and does not include existing ambient noise.*

***Predicted values are lower than existing ambient values. This is due to the analysis only reporting on values caused by the HVDC converter station and not the summation of noise at the ambient measurements.*

5.3.6.2.1 Mitigation Measures

The testing and modeling performed for the HVDC converter station site included baseline ambient sound levels measured in or near the area of operation and station noise levels predicted from the Project operation. Per the analysis performed, it is estimated the maximum noise levels at the fence line of the HVDC converter station will need to be at 83 dBA or below to achieve compliance with the local and state ordinances.

The results of this acoustic modeling assessment indicate that the audible noise produced by the HVDC converter station is expected to be 60 dB(A) or less at the property line. This is below the noise level

deemed reasonable by the town of Somerset for property zoned as Industrial (70 dBA) between 10:00 pm to 7:00 a.m. This value also meets the MassDEP requirement to be no more than 10 dBA greater than ambient noise levels at any inhabited buildings near the property for sound produced by the facility during its 24-hour operation.

Mayflower Wind will include achieving compliance with the local and state ordinances in the performance requirements of the HVDC specification issued to the vendor/supplier. The HVDC supplier will be responsible for (1) demonstrating their proposed solution will meet the noise level requirements, and (2) verifying compliance by performing post-construction noise measurements.

5.3.7 Air Quality

The following section discusses air quality with respect to offshore construction in State waters and onshore construction activities at Brayton Point. Emissions associated with offshore construction activities are addressed to offer a complete characterization of construction related air emissions.

5.3.7.1 Offshore Construction

For the offshore export cable construction in State waters, air emissions will be primarily from internal combustion engines, including marine diesel engines, diesel engines on construction equipment, and diesel generators. At this stage of the Project, the specific vessels (and hence, engines) that will be used for the Project are hypothetical but are anticipated to be further refined in the Fabrication and Installation Report submitted to BOEM. However, vessels may still be changed out prior to and during construction due to availability at that time.

Regardless of the specific vessels utilized during the offshore export cable installation, sulfur dioxide (SO_2) and particulate matter (PM) emissions will be mitigated with the use of clean, low-sulfur fuels in compliance with the air pollution requirements described below.

Annex VI of the International Maritime Organization's International Convention for the Prevention of Pollution from Ships (MARPOL) treaty, which is the main international treaty that addresses air pollution from marine vessels, is implemented through the Act to prevent pollution from ships (33 U.S.C. §§ 1901-1905) and control of NOx, SOx, and PM emissions from marine engines and vessels subject to the MARPOL protocol (40 C.F.R.). MARPOL Annex VI specifies a fuel oil sulfur content limit of 1,000 parts per million (ppm), with which any foreign and domestic vessel used during the Project will comply. Regulations of Fuels and Fuel Additives outlined in 40 C.F.R. 80 limits the sulfur content of non-road diesel fuel to 15 ppm. All non-road engines (e.g., generators used offshore) will comply with this limit.

USEPA emission standards for marine compression-ignition engines are contained in the regulations listed below:

- MARPOL Annex VI: Establishes NOx emissions limits from foreign vessels built after 2000 with engines greater in size than 130 (kW) (~174 horsepower) as well as global limits on the sulfur content of fuel oil used aboard any foreign or domestic vessel.
- 40 C.F.R. 89, Control of Emissions from New and In-Use Nonroad Compression- Ignition Engines: Sets emission standards and certification requirements for domestic Tier 1 and 2 domestic marine diesel engines below 37 kW (~50 horsepower).
- 40 C.F.R. 94, Control of Emissions from Marine Compression-Ignition Engines: Sets emission standards and certification requirements for Tier 1 and 2 domestic marine diesel engines at or above 37 kW and manufactured on or after January 1, 2004.

- 40 C.F.R. 1042, Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels: Sets emission standards and certification requirements for Tier 3 and 4 domestic marine diesel engines.

Each tier was phased in over numerous years, with each tier becoming progressively more stringent. The marine engines and generators used during this Project will be certified by the manufacturer to comply with the applicable marine engine emission standards for NOx, CO_2, VOCs (as hydrocarbons), and PM.

USEPA's OCS Air Regulations (40 C.F.R. 55) implement Section 328(a)(1) of the Clean Air Act and establish federal air pollution control requirements for OCS sources located beyond a state's seaward boundaries. Air emissions generated by the Project within federal waters are regulated through the OCS Air Permit process under 40 C.F.R. 55. The air quality requirements of the Corresponding Onshore Area also apply to sources located within 25 mi (40 km) beyond a state's seaward boundary. If Massachusetts is designated as the Corresponding Onshore Area as Mayflower Wind anticipates, the Project's OCS Sources will be required to comply with the applicable Massachusetts air quality regulations. Best Available Control Technology and Lowest Achievable Emission Rate under 310 CMR § 7.00 will require Mayflower Wind's OCS Air Permit to contain, at a minimum, emission limitations, monitoring, testing, and reporting requirements for OCS Sources. It is anticipated that Project vessels which are designated as OCS Sources will be required to have engines meeting USEPA's or International Maritime Organization's highest applicable marine emission standards, where available. Additionally, the Project will acquire emissions offsets in compliance with the Nonattainment New Source Review program, if required, to offset applicable NOx and VOC emissions.

5.3.7.2 Onshore Construction

Project impacts associated with onshore construction include construction vehicle emissions, construction equipment emissions, and the generation of fugitive dust during construction. Air emissions during the construction phase of the proposed Project will be mostly influenced by fuel combustion from engines and auxiliary equipment. Temporary and minor impacts to ambient air quality from onshore construction equipment will be localized to areas adjacent to active construction. Mayflower Wind will complete construction in accordance with applicable sections. o the MassDEP Air Pollution Control Regulations at 310 CMR 7.00. Details on mitigation are provided in Section

5.3.8 Electric and Magnetic Field Analysis

Mayflower Wind understands that electric and magnetic fields (EMFs) produced by the transmission of electricity can be a concern to communities where transmission infrastructure is sited. Mayflower Wind has studied predicted EMF from the Project and continues to engage stakeholders on this topic through direct outreach and the publication of EMF materials on a dedicated web page for the local community.[18]

EMFs are created anywhere there is a flow of electricity, and their strength diminishes within a short distance from the source. The strength of electric fields depends on voltage, which is the pressure behind the flow of electricity. Electric fields are not an issue for the proposed cables because the electric fields arising from the voltage will be shielded by the cable materials.

Magnetic fields (MFs) are produced by current, which is the flow of electricity. An MF Analysis study was conducted to model the MFs produced by typical onshore and offshore cable configurations for the Project and contextualize them to the latest research and guidelines for public health and the marine

[18] https://mayflowerwind.com/southcoast/

environment (see Attachment K). Predicted HVDC and 60-Hz HVAC MFs are well-below health-based exposure guidelines.

The wind farm is expected to operate at an annual-average capacity factor of around 50 percent; thus, much of the time, the actual output and MF attributable to the Project cables will be correspondingly lower than the values presented in Tables 5-3 and 5-4, which are for maximum output.

5.3.8.1 Offshore Magnetic Field Analysis

Three configurations of offshore HVDC cables were modeled, including the typical installation case where the two DC conductors are bundled together as well as two atypical, worst-case installation scenarios.[19] Only for the two atypical installation cases will MF levels above the offshore export cables appreciably differ from the earth's steady (DC) geomagnetic field, and only within short distances from the cables.

TABLE 5-3. SUBMARINE MAGNETIC FIELD STUDY RESULTS

Case		Magnetic Field [a] (milligauss [b])			
		Max	10 ft	25 ft	50 ft
1	HVDC offshore, bundled, 6.6 ft burial depth. [c]	123	38.7	8.4	2.2
2	HVDC offshore, bundled, on seafloor under a 1.0 ft concrete mattress. [d]	3785	55.7	9.0	2.2
3	HVDC offshore, non-bundled, 164 ft cable separation, 6.6 ft burial depth. [c]	1909	1120	579	360

[a] Magnetic field results at maximum and at varying distances from the centerline (or from cable in separated offshore case).
[b] Milligauss is a unit of magnetic flux density; however, the generic term "magnetic field" is used throughout this document.
[c] Results are reported at the sea floor.
[d] Results are reported at the surface of the concrete mattress.

No regulatory thresholds or guidelines for allowable EMF levels in marine environments have been established for either HVDC or HVAC transmission. Overall, although knowledge gaps remain and there is a need for continued research, the weight of the currently available evidence does not provide support for concluding there would be population-level harms to marine species from EMF associated with HVDC submarine transmission. This conclusion regarding a lack of evidence of population-level harms to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews. More information and literature references on MFs can be found in Attachment K.

5.3.8.2 Onshore Magnetic Field Analysis

For the three representative HVDC onshore duct bank configurations that were modeled, cases (5), (6), and (7), peak maximum DC MF levels ranging from 181 to 433 milligauss (mG) were obtained at 1 meter above the ground surface, which is far below health-based exposure guidelines for DC MFs. For each duct bank configuration, the MF levels drop off very rapidly with increasing lateral distance from the cables, for example, ranging from 3.5 to 30.5 mG at 25 feet (7.6 meters) from the duct bank centerlines.

[19] One worst-case installation case assumes the bundled conductors are laid directly on the seafloor surface and covered by a concrete mattress, such as at a cable crossing location. The other is an unbundled installation case where the two DC conductors are separately buried approximately 164 ft (50 m) apart at a target depth of 2.0 m to be used as needed to ensure safe installation and repair of the separate cables, as well as to minimize risk of damage to both cables from threats such as anchor strike.

The state of Massachusetts has not adopted standards for EMFs from HVDC transmission lines or other sources that can be compared to the model-predicted DC MFs. There are also no U.S. federal standards limiting general public or occupational exposure to EMFs from HVDC transmission lines. Scientists have not reported any confirmable chronic health risks for the weak steady EMFs associated with HVDC power transmission; this is consistent with the fact that humans have lived for tens of thousands of years in the presence of the earth's DC geomagnetic field, which is not known to adversely interact with biological processes or directly affect human health.

TABLE 5-4. MAGNETIC FIELD STUDY RESULTS FOR ONSHORE CABLES

Case		Magnetic Field [a] (milligauss [b])			
		Max	10 ft	25 ft	50 ft
5	HVDC onshore, single circuit duct bank, 3.2 ft burial depth. [c]	433	140	30.5	8.0
6	HVDC onshore, double circuit duct bank, 3.3 ft burial depth. [c]	252 (181) [d]	101 (37.4)	20.6 (3.9)	5.2 (0.53)
7	HVDC onshore, alternate double circuit duct bank, 3.4 ft burial depth. [c]	259 (188) [d]	95.8 (34.9)	18.9 (3.5)	4.7 (0.47)
8	HVAC onshore, single circuit duct bank (2 cables per phase), 3.3 ft burial depth. [c]	66.7 [e]	13.9	1.5	0.20

[a] Magnetic field results at maximum and at varying distances from the centerline (or from cable in separated offshore case).
[b] Milligauss is a unit of magnetic flux density; however, the generic term "magnetic field" is used throughout this document.
[c] Results are reported at a height of 1 meter above the ground surface in accordance with industry standard practice.
[d] The double circuit duct bank configurations correspond to the Noticed Variation. Although the Noticed Variation does not include a request for approval of additional export cables at this time, for informational purposes only, results are also presented in parenthesis for an indicative future scenario with a second 1200 MW circuit installed. The reduction in MFs associated with the future scenario is due to field cancelling effects introduced by the second circuit.
[e] Field values for the AC case are root-mean-square (rms).

A short onshore underground HVAC transmission route segment (approximately 0.2 mile [0.3 km]) will connect the Mayflower Wind HVDC converter station and the POI at the existing National Grid 345-kV substation, also located on the former Brayton Point Power Station property. For this short segment, the 345-kV onshore export cables will be buried underground within concrete duct banks. A peak 60-Hertz (Hz) AC MF level of 66.7 mG was obtained at a height of 1 meter directly above the duct bank. The modeling for case (8) demonstrated that MF levels drop off very rapidly with lateral distance from the cables, with MF levels of 13.9 mG and 1.5 mG at distances of +10 ft (3.0 m) and +25 ft (7.6 m), respectively, from the duct bank centerline.

The modeled MFs for the onshore 345-kV HVAC cables, including those directly above the underground duct bank, are all well below the ICNIRP health-based guideline of 2,000 mG for allowable public exposure to 60-Hz AC magnetic fields. In addition, all 60-Hz AC MF levels are also below the Massachusetts guideline of 85 mG for MFs at ROW edges. This guideline is not health-based and was instead adopted in the 1980s to maintain the status quo for MF levels on and near overhead transmission line ROWs. More information and literature references on MFs can be found in Attachment K.

5.4 ENVIRONMENTAL JUSTICE

Mayflower Wind will comply with directives of the Massachusetts legislature in Section 58 of *An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy* signed by Governor Charlie Baker on March 26, 2021, St. 2021, c. 8 (*2021 Climate Act*), as interpreted through state agency regulations

and protocols. In response to this legislation, the EEA EJ Policy was updated on June 24, 2021 (2021 EEA EJ Policy).[20]

In compliance with the *2021 Climate Act*, the MEPA Office released the final version of its new regulations and two final protocols regarding new MEPA review procedures to evaluate project impacts on EJ populations. The regulations took effect on December 24, 2021 and the two protocols took effect on January 1, 2022. The "Public Involvement Protocol" expands on, but does not supersede, the requirements of the EJ Policy issued by EEA in June, 2021. The EJ Screening Form, which must be used to provide applicable EJ populations advance notice of the filing of an ENF is appended to the protocol. The "Impacts Analysis Protocol" provides guidance for analysis of project impacts, including disproportionate adverse effects and potential climate change impacts, on EJ populations.

As of the time of the filing of this Petition with the Siting Board Mayflower Wind completed a MEPA Environmental Notification Form for the Project. Mayflower Wind expects to file the Project ENF in accordance with the new MEPA EJ protocols in the near future.

Part of Mayflower Wind's considerations in selecting its Preferred and Noticed Alternative Routes was to avoid or minimize impacts to EJ Populations.[21] The Project will advance the transition to a just and equitable cleaner energy future by creating renewable, clean energy jobs that pay prevailing wage, and by delivering such energy at a low-cost to families and businesses. Mayflower Wind intends to engage in programs that support workers in the transition to the clean energy future, specifically through development of programs to recruit, train, and retain women, people of color, indigenous people, veterans, formerly incarcerated people, and people living with disabilities in jobs related to a cleaner energy economy.

This section provides information on potential impacts on EJ Populations and host communities. It describes the socioeconomic characteristics of overburdened communities in minority, low-income, or indigenous populations in the jurisdictions affected by the Project and includes an evaluation of potential Project-related effects, as well as proposed avoidance, minimization, and mitigation measures.

The 2021 EEA EJ Policy builds on federal environmental justice guidelines established in Federal Executive Order 12898[22] and has been developed in ways that reflect the needs and circumstances specific to Massachusetts. The underlying purpose of the 2021 EEA EJ Policy is to ensure that all communities have a strong voice in environmental decision-making regardless of race, color, national origin, income, or English language proficiency, that such voices can influence environmental decision-making, and that the Commonwealth prioritize increased investment in the preservation and enhancement of the Commonwealth's open spaces and urban park network (see Tale 5-5). In addition, the 2021 EEA EJ Policy emphasizes that increased attention must be focused on communities that are built in and around the state's oldest areas with a legacy of environmental pollution, particularly in areas with residents who have elevated rates of disease and health burdens.

The 2021 EEA EJ Policy contains provisions that apply to projects that are proposed near EJ Populations, including provisions that require enhanced analysis of impacts and mitigation under the Massachusetts Environmental Policy Act (MEPA) for projects that exceed certain thresholds, and provisions applicable

[20] Massachusetts Executive Office of Energy and Environmental Affairs, Environmental Justice Policy (June 24, 2021) https://www.mass.gov/doc/environmental-justice-policy6242021-update/download. The 2021 EEA EJ Policy replaces the 2017 and 2015 EEA EJ policies.

[21] As defined in the 2021 Climate Act and the 2021 EEA EJ Policy.

[22] 59 Fed. Reg. 7629, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994) https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf.

to both public participation and analysis of impacts and mitigation by the MA EFSB. The MEPA office finalized two MEPA protocols, placed into effect on January 1, 2022.[23]

Under the 2021 EEA EJ Policy, an EJ Population includes four categories of neighborhoods (defined as census block groups) with certain demographic characteristics based on median income level, percentage of residents who are people of color (i.e., minority), and percentage of residents who have limited English proficiency. A neighborhood is defined as an EJ population if one or more of the following criteria are true: the annual median household income is not more than 65 percent of the statewide annual median household income; or

- minorities comprise 40 percent or more of the population; or
- 25 percent or more of households lack English language proficiency; or
- minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

Neighborhoods are defined by the United States Census Bureau census block group data for minority criteria and American Community Survey data for state median income and English isolation criteria. The census block group is the smallest geographic unit for which United States Census Bureau demographic data is available and is best suited for identifying EJ populations at a desktop level.

The MEPA Interim Project Impact Protocol requires applicants to identify all EJ populations within 1.0-mi and 5.0-mi of the Project.[24] Identification of the likely effects on EJ populations 5.0-mi from the Project is only necessary if the Project exceeds MEPA the air threshold[25] and/or the Project will generate 150 or more average daily trips of diesel vehicle traffic over a duration of one year or more.

5.4.1 Description of Affected Environment

The development of the onshore Project area at Brayton Point will advance the Commonwealth's EJ Policy goals by:

- Promoting Brownfields revitalization at Brayton Point, a Brownfields site, for a clean energy project.
- Promoting regional and local partnerships focused on workforce development, supply chain improvements, ports and infrastructure upgrades, and other economic development activities and increasing job opportunities.
- Taking direct actions that address climate change and public health that should improve the overall quality of life for residents in the community.

The Project's redevelopment/revitalization of a former existing industrial site will lead to an influx of positive socioeconomic impacts to the surrounding communities, including the creation of jobs, continued maintenance on the existing facility, and converting an existing industrial site to new uses as a renewable energy hub.

[23] Final MEPA Public Involvement Protocol for Environmental Justice Populations (effective January 1, 2022) https://www.mass.gov/doc/final-mepa-public-involvement-protocol-for-environmental-justice-populations-effective-date-of-january-1-2022/download (MEPA EJ Public Involvement Protocol);FINAL MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations (effective January 1, 2022) https://www.mass.gov/doc/final-mepa-interim-protocol-for-analysis-of-project-impacts-on-environmental-justice-populations-effective-date-of-january-1-2022/download (MEPA Interim Project Impact Protocol).
[24] MEPA Interim Project Impact Protocol at 1.
[25] As identified in 201 CMR 11.03(8)

The Project has the potential to beneficially affect communities, the economy, and the environment directly and indirectly at the local and regional levels. Following the MEPA Interim Project Impact Protocol, Mayflower Wind identified a broader Environmental Justice Study Area as defined by Bristol County. Neighboring counties of Barnstable, Dukes, Nantucket and Plymouth were included for comparison purposes.

In addition, a more detailed review at the census tract level, within 1-mile of the Project using the Massachusetts Department of Public Health (DPH) EJ Tool [26] and Massachusetts Environmental Justice Map Viewer [27] is included in this review. Figure 5-9 shows the EJ populations within 1-mile and 5-miles of the Project.

Table 5-5 depicts the race and ethnicity demographics of the study area by county. Based on the 2020 census estimates, almost 70 percent of the population in Massachusetts is white. The white population in each of the five-county study area is higher than the state average, with Bristol County at 78.7 percent. The minority population in each of these counties is less than the statewide average of 30.4 percent. The population in these counties does not meet the definition of a minority population.

[26] Massachusetts Environmental Public Health Tracking, Environmental Justice https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html.
[27] Massachusetts Executive Office of Energy and Environmental Affairs, Mapping Tools https://mass-eoeea.maps.arcgis.com.

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TABLE 5-5. RACE AND ETHNICITY BY COUNTY

% of Population										
Geographic Area	Total Population	American Indian and Alaska Native	Asian	Black or African American*	Hispanic or Latino	Native Hawaiian and Pacific Islander	Some Other Race*	Two or More Races*	White*	Total Minority (%)**
Massachusetts	7,029,917	0.3%	7.2%	7.0%	12.6%	0.0%	7.1%	8.7%	69.6%	30.4%
Bristol County	579,200	0.4%	2.4%	4.4%	9.5%	0.0%	5.3%	8.8%	78.7%	21.3%
Barnstable County	228,996	0.5%	1.4%	2.9%	3.5%	0.0%	2.4%	6.9%	85.8%	14.2%
Dukes County	20,600	1.0%	0.9%	3.9%	2.6%	0.0%	4.0%	10.8%	79.2%	20.8%
Nantucket County	14,255	0.6%	1.9%	7.2%	16.2%	0.0%	9.3%	9.7%	71.3%	28.7%
Plymouth County	530,819	0.2%	1.5%	8.5%	4.5%	0.0%	3.8%	8.5%	77.5%	22.5%

Source: 2020 U.S. Census Bureau

** The Federal Government considers race and Hispanic/Latino origin (ethnicity) to be two separate and distinct concepts. People identifying as Hispanic or Latino origin may be of any race. The data summarized in this table present Hispanic/Latino as a separate category.*

*** The total minority population is the sum of the Black or African American, Hispanic or Latino, Asian, Native American and Alaska Native, and Other Race categories shown here.*

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Table 5-6 depicts the income and poverty demographics of the study area by county. The 2019 American Community Survey estimate for the level of poverty in Bristol County is 11.4 percent. This is higher than the state average of 9.4 percent and higher than the other four counties in the study area. The median household income in Bristol County is $70,402 or 82 percent of the median in the Commonwealth.

TABLE 5-6. MEDIAN HOUSEHOLD INCOME AND POVERTY BY COUNTY

Geographic Area	Total Population	Median Household Income ($)*	Proportion of State Median (%)	Population Below Poverty Level (%)
Massachusetts	7,029,917	$85,843	100%	9.4%
Bristol County	579,200	$70,402	82%	11.4%
Barnstable County	228,996	$85,042	99%	5.2%
Dukes County	20,600	$71,811	84%	7.6%
Nantucket County	14,255	$107,717	125%	5.2%
Plymouth County	530,819	$90,880	106%	7.2%

Source: 2019 American Community Survey 1-Year Estimates
** In 2019 inflation adjusted dollars*

Table 5-7 depicts the employment information of the study area by county. Aside from Nantucket County, the employment rate based on the population of individuals 16 years and above is lower than the state average of 64.8 percent. The unemployment rate in Bristol County is 4.0 percent, slightly higher than the state average of 3.9 percent. Plymouth County is highest at 4.4 percent. The population of individuals who are 25 years and older and with a bachelor's degree or higher is also much lower in these two counties compared to the state average of 45 percent (approximately 30 percent in Bristol County and 38 percent in Plymouth County.) The income per capita in Bristol County is $36,343. It is the lowest of the five counties and significantly below the state average of $46,241.

TABLE 5-7. EMPLOYMENT INFORMATION REGARDING THE POTENTIALLY AFFECTED ENVIRONMENT

Geographic Area	Population Age 16 years +	Employed Population 16 years +	Employment Rate (%)	Unemployment Rate (%)	Per Capital Income ($ 2019 Inflation Adjusted Dollars) *	Education Attainment (Bachelor's Degree or Higher in Massachusetts) **
Massachusetts	5,707,254	3,700,243	64.8%	3.9%	$46,241	45.0%
Bristol County	464,791	287,269	61.8%	4.0%	$36,343	30.1%
Barnstable County	185,539	108,192	58.3%	3.1%	$50,384	47.1%
Dukes County	N.A.	N.A.	60.1%	N.A.	N.A.	44.9%
Nantucket County	N.A.	N.A.	70.7%	N.A.	N.A.	52.8%
Plymouth County	424,269	271,697	64.0%	4.4%	$45,122	38.2%

Source: 2019 American Community Survey 1-Year Estimates
** In 2019 inflation adjusted dollars*
*** Educational attainment of population 25 years and over*

Larger and more populated geographic areas may have the effect of masking or diluting the presence of concentrations of minority and/or low-income populations. Using the EJ Maps Viewer, a more detailed analysis of the census tract located within one mile of the Project is included in this review.

5.4.1.1.1 One-mile of the Project

A census block group (CBG) is a statistical subdivision of a census tract, generally defined to contain between 600 and 3,000 people. There is a total of 18 CBGs located within one mile of the Project: 14 have been identified as meeting the Massachusetts EJ Policy for an EJ Community; 13 are across the Taunton River, in the City of Fall River; and one is northwest of the Project, in the Town of Swansea (see Table 5-8 and Figure 5-9). These 14 CBGs, all within Bristol County, represent a population of 15,990 or 2.8 percent of the population in the county. The Town of Somerset does not contain any neighborhoods that meet any EJ criteria.

Due to the geographic location of the Project, with the Lee River and Taunton River separating Brayton Point from the EJ communities, the proposed Project should have minimal impact on nearby EJ populations.

TABLE 5-8. POTENTIALLY AFFECTED ENVIRONMENT

Census Block Group (CBG)	Municipality	Median Household Income ($)	Minority Population (%)	Households with Language Isolation (2000 Census)	Population	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Block Group 3, Census Tract 644200	Somerset	$100,417	117.0%	7.8%	2,026	NA	No EJ Population
Block Group 4, Census Tract 644200	Somerset	$81,429	94.9%	3.7%	1,258	4.8%	No EJ Population
Block Group 3, Census Tract 6451.01	Swansea	$55,313	64.4%	3.1%	1,901	1.0%	0.0 Income
Block Group 4, Census Tract 645101	Swansea	NA	NA	NA	1,864	NA	No EJ Population
Block Group 2, Census Tract 645102	Swansea	$57,188	66.6%	7.3%	1,177	0.0%	No EJ Population
Block Group 1, Census Tract 6403	Fall River	$25,792	30.0%	38.4%	1,257	13.3%	1.0 Minority and Income
Block Group 2, Census Tract 6403	Fall River	$52,054	60.6%	17.5%	1,133	4.4%	2.0 Income
Block Group 3, Census Tract 6403	Fall River	$27,168	31.6%	36.2%	1,587	7.3%	3.0 Minority and Income
Block Group 1, Census Tract 6404	Fall River	$40,804	47.5%	11.3%	381	33.7%	4.0 Income 5.0 English Isolation Portuguese or Portuguese Creole: 10%
Block Group 3, Census Tract 6404	Fall River	$50,282	58.6%	8.8%	927	0.0%	6.0 Income
In the 1-mil	Fall River	$64,580	75.2%	34.6%	1,397	27.1%	7.0 Minority 8.0 English isolation Spanish or Spanish Creole: 7.4%
Block Group 5, Census Tract 6405	Fall River	$44,921	52.3%	18.5%	1,835	15.9%	9.0 Income
Block Group 1, Census Tract 6409.01	Fall River	$44,096	51.4%	43.2%	760	0.0%	10.0 Minority 11.0 Income

Census Block Group (CBG)	Municipality	Median Household Income ($)	Minority Population (%)	Households with Language Isolation (2000 Census)	Population	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Block Group 4, Census Tract 6409.01	Fall River	$70,438	82.1%	25.6%	1,073	29.4%	12.0 Minority 13.0 English isolation Portuguese or Portuguese Creole: 13.3%
Block Group 5, Census Tract 6409.01	Fall River	$34,261	39.9%	5.2%	463	0.0%	14.0 Income
Block Group 1, Census Tract 6410	Fall River	$20,339	23.7%	22.5%	937	5.6%	15.0 Income
Block Group 3, Census Tract 6410	Fall River	$28,417	33.1%	38.1%	958	26.9%	16.0 Minority and Income 17.0 English isolation Portuguese or Portuguese Creole: 14.5%
Block Group 3, Census Tract 6420	Fall River	$22,134	25.8%	37.7%	1,381	10.9%	18.0 Minority and Income

Source: Environmental Justice (EJ) Population Data is derived from the 2019 American Community Survey based upon demographic criteria developed by the Massachusetts Executive Office of Energy and Environmental Affairs

5.4.1.1.2 Low-Income Population

The criteria for an income-based EJ population is met when the annual median household income is not more than 65 percent of the statewide annual median household income. As shown in Table 5-8, all but two of the 14 EJ CBGs within one mile of the Project meet this criterion. Median household income as a percentage of the Commonwealth ranges from 23.7 percent in Fall River to 64.4 percent in Swansea. The average EJ median income is 48.3 percent of the statewide average while the overall county average is 82 percent.

5.4.1.1.3 Minority Populations

A community satisfies the EJ criterion for racial composition when minorities make up 40 percent or more of the population. The total minority population in the identified EJ areas (Table 5-8) ranges from 3.1 percent to 43.2 percent. Only one CBG in Fall River meets the race only criterion at 43.2 percent. There are an additional five CBGs with a minority population higher than the state average of 30.4 percent. As shown in Table 5-8, the City of Fall River has a minority population of 26.6 percent compared to 7.4 percent in both Somerset and Swansea. The minority population in Fall River mostly consists of two or more races, some other race and Black or African American residents.

5.4.1.1.4 English Language Proficiency

To meet the language criteria for an EJ population, 25 percent or more of households must lack English language proficiency. Four of the 14 EJ CBGs in this study area in Bristol County meet this definition. In three of four CBGs, Portuguese or Portuguese Creole is the primary language. Spanish or Spanish Creole is spoken in the fourth CBG. The fraction of EJ households with language isolation (Table 5-8) is 12.5 percent, compared to City of Fall River's average of 9.7 percent and the statewide average of 4.7 percent.

5.4.1.1.5 Minority and Low-Income Population

Four CBGs meet this EJ definition: the population consists of 25 percent or more minorities, and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

5.4.1.1.6 Five-miles of the Project

As shown in Figure 5-9 and in Table 5-9 below, there are 65 EJ populations within five miles of the Project. One in the Town of Swansea, another in the Town of Westport and the remaining 63 in the City of Fall River. Income is once again the biggest reason for the EJ designation. Of the CBGs, 32 are designated for income alone; 22 for minority and income; two for income and isolation; three for minority, income and isolation; and four for minority population alone.

The average income in these EJ CBGs is $37,976. This is well below the state average of $85,843 and 54 percent of the average in Bristol County.

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TABLE 5-9. EJ POPULATIONS WITHIN 5-MILES OF THE PROJECT (BY CENSUS BLOCK GROUPS)

Census Block Group (CBG)	Municipality	Population	Minority Population (%)	Households with Language Isolation (2000 Census)	Median Household Income ($)	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
1-mile (same as Table 5.4.1.5)							
Block Group 3, Census Tract 6451.01	Swansea	1,901	3%	1%	$55,313	64%	Income
Block Group 1, Census Tract 6403	Fall River	1,257	38%	13%	$25,792	30%	Minority and income
Block Group 2, Census Tract 6403	Fall River	1,133	17%	4%	$52,054	61%	Income
Block Group 3, Census Tract 6403	Fall River	1,587	36%	7%	$27,168	32%	Minority and income
Block Group 1, Census Tract 6404	Fall River	381	11%	34%	$40,804	48%	Income and English isolation
Block Group 3, Census Tract 6404	Fall River	927	9%	0%	$50,282	59%	Income
Block Group 4, Census Tract 6405	Fall River	1,397	35%	27%	$64,580	75%	Minority and English isolation
Block Group 5, Census Tract 6405	Fall River	1,835	18%	16%	$44,921	52%	Income
Block Group 1, Census Tract 6409.01	Fall River	760	43%	0%	$44,096	51%	Minority and income
Block Group 4, Census Tract 6409.01	Fall River	1,073	26%	29%	$70,438	82%	Minority and English isolation
Block Group 5, Census Tract 6409.01	Fall River	463	5%	0%	$34,261	40%	Income
Block Group 3, Census Tract 6410	Fall River	958	38%	27%	$28,417	33%	Minority, income and English isolation
Block Group 3, Census Tract 6420	Fall River	1,381	38%	11%	$22,134	26%	Minority and income

Census Block Group (CBG)	Municipality	Population	Minority Population (%)	Households with Language Isolation (2000 Census)	Median Household Income ($)	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Between 1-5 miles							
Block Group 1, Census Tract 6401	Fall River	1,273	25%	1%	$37,266	43%	Minority and income
Block Group 2, Census Tract 6401	Fall River	724	32%	14%	$38,571	45%	Minority and income
Block Group 1, Census Tract 6402	Fall River	519	7%	6%	$42,298	49%	Income
Block Group 2, Census Tract 6402	Fall River	459	15%	16%	$19,640	23%	Income
Block Group 3, Census Tract 6402	Fall River	1,515	35%	10%	$21,889	25%	Minority and income
Block Group 4, Census Tract 6402	Fall River	1,813	18%	15%	$22,813	27%	Income
Block Group 5, Census Tract 6402	Fall River	1,848	42%	14%	$48,106	56%	Minority and income
Block Group 2, Census Tract 6404	Fall River	1,467	27%	10%	$37,313	43%	Minority and income
Block Group 1, Census Tract 6405	Fall River	615	12%	0%	$13,589	16%	Income
Block Group 2, Census Tract 6405	Fall River	492	19%	16%	$34,297	40%	Income
Block Group 3, Census Tract 6405	Fall River	641	16%	11%	$50,667	59%	Income
Block Group 1, Census Tract 6406	Fall River	595	16%	24%	$27,063	32%	Income
Block Group 2, Census Tract 6406	Fall River	1,154	21%	8%	$49,390	58%	Income
Block Group 3, Census Tract 6406	Fall River	1,713	27%	11%	-	0%	Minority
Block Group 4, Census Tract 6406	Fall River	1,001	8%	5%	$42,932	50%	Income

Census Block Group (CBG)	Municipality	Population	Minority Population (%)	Households with Language Isolation (2000 Census)	Median Household Income ($)	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Block Group 1, Census Tract 6407	Fall River	1,415	13%	5%	$43,179	50%	Income
Block Group 2, Census Tract 6407	Fall River	657	6%	0%	$55,000	64%	Income
Block Group 1, Census Tract 6408	Fall River	845	28%	10%	$34,938	41%	Minority and income
Block Group 2, Census Tract 6408	Fall River	1,106	20%	25%	$47,500	55%	Income and English isolation
Block Group 2, Census Tract 6409.01	Fall River	1,497	24%	6%	$43,553	51%	Income
Block Group 3, Census Tract 6409.01	Fall River	2,077	49%	14%	$45,861	53%	Minority and income
Block Group 1, Census Tract 6410	Fall River	937	23%	6%	$20,339	24%	Income
Block Group 2, Census Tract 6410	Fall River	513	32%	13%	$40,402	47%	Minority and income
Block Group 1, Census Tract 6411.01	Fall River	990	26%	22%	$19,181	22%	Minority and income
Block Group 2, Census Tract 6411.01	Fall River	581	40%	6%	$15,777	18%	Minority and income
Block Group 1, Census Tract 6412	Fall River	2,213	34%	13%	$29,079	34%	Minority and income
Block Group 2, Census Tract 6412	Fall River	1,057	12%	7%	$35,521	41%	Income
Block Group 1, Census Tract 6413	Fall River	875	96%	44%	$21,033	25%	Minority, income and English isolation
Block Group 3, Census Tract 6413	Fall River	738	39%	11%	-	0%	Minority

Census Block Group (CBG)	Municipality	Population	Minority Population (%)	Households with Language Isolation (2000 Census)	Median Household Income ($)	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Block Group 4, Census Tract 6413	Fall River	1,322	46%	4%	$67,509	79%	Minority
Block Group 5, Census Tract 6413	Fall River	1,012	24%	7%	$26,985	31%	Income
Block Group 1, Census Tract 6414	Fall River	699	54%	22%	$48,203	56%	Minority and income
Block Group 2, Census Tract 6414	Fall River	912	33%	9%	$25,828	30%	Minority and income
Block Group 3, Census Tract 6414	Fall River	1,103	32%	27%	$23,701	28%	Minority, income and English isolation
Block Group 1, Census Tract 6415	Fall River	1,286	26%	24%	$40,000	47%	Minority and income
Block Group 2, Census Tract 6415	Fall River	1,106	10%	0%	$43,889	51%	Income
Block Group 1, Census Tract 6416	Fall River	787	21%	2%	$51,500	60%	Income
Block Group 2, Census Tract 6416	Fall River	1,323	0%	9%	$40,484	47%	Income
Block Group 2, Census Tract 6417	Fall River	1,265	4%	10%	$53,897	63%	Income
Block Group 4, Census Tract 6417	Fall River	1,518	17%	2%	$46,797	55%	Income
Block Group 3, Census Tract 6418	Fall River	414	10%	7%	$46,394	54%	Income
Block Group 1, Census Tract 6419	Fall River	979	42%	2%	$52,986	62%	Minority and income
Block Group 2, Census Tract 6419	Fall River	1,125	27%	18%	$34,808	41%	Minority and income
Block Group 2, Census Tract 6420	Fall River	873	35%	13%	-	0%	Minority
Block Group 1, Census Tract 6421	Fall River	2,017	14%	0%	$49,543	58%	Income

Census Block Group (CBG)	Municipality	Population	Minority Population (%)	Households with Language Isolation (2000 Census)	Median Household Income ($)	Median Household Income (% of the MA Median)	EJ Population as Defined by the Commonwealth of MA
Block Group 2, Census Tract 6421	Fall River	1,066	29%	22%	$38,814	45%	Minority and income
Block Group 1, Census Tract 6422	Fall River	898	12%	0%	$54,500	63%	Income
Block Group 2, Census Tract 6422	Fall River	1,177	50%	6%	$29,869	35%	Minority and income
Block Group 3, Census Tract 6422	Fall River	1,420	17%	3%	$47,375	55%	Income
Block Group 4, Census Tract 6422	Fall River	840	5%	8%	$51,780	60%	Income
Block Group 1, Census Tract 6424	Fall River	1,259	20%	9%	$40,139	47%	Income
Block Group 3, Census Tract 6461.01	Westport	1,688	2%	4%	$55,950	65%	Income

Source: Environmental Justice (EJ) Population Data is derived from the 2019 American Community Survey based upon demographic criteria developed by the Massachusetts Executive Office of Energy and Environmental Affairs.

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5.4.2 Potential Effects on EJ Populations

The construction and operation of the proposed Project will have an overall positive effect on employment and the economy of the region. Under the terms of an agreement with Massachusetts Clean Energy Center, Mayflower Wind has made a financial commitment for initiatives including $5 million in workforce development that could benefit EJ populations and an additional $5 million towards low-income strategic electrification.

Since the converter station at Brayton Point is located on a privately-owned site that has no pedestrian access, few effects on population and housing are expected in the Town of Somerset and its immediate community.

5.4.2.1.1 Traffic

During construction, there will be an increase in vehicle traffic along and to and from the onshore Project components. Nearby communities, including potential EJ populations, will experience an increase in construction-related activities, including a short-term increase in construction-related noise and equipment emissions. The Project will use existing roads, ROWs, and infrastructure where possible. Therefore, impacts of construction activities would be minimized to the extent practicable and are anticipated to be similar in nature to other utility or road improvement works carried out in these locations. Impacts are expected to be similar during Project decommissioning. There are no significant disruptions to traffic expected that would affect EJ populations.

Operation and maintenance activities will result in a small increase in Project-related vehicle traffic around the onshore Project components, but the numbers are anticipated to be low and are not expected to result in a noticeable increase to existing traffic volumes in the area.

Mayflower Wind will work with the Town of Somerset to develop a Traffic Management Plan to minimize disruptions to residences and commercial establishments in the vicinity of construction and installation activities. Construction monitoring would ensure compliance with the Traffic Management Plan. Mayflower Wind will develop an onshore construction schedule to minimize effects to neighboring recreation and seasonal tourism activities to the extent feasible, and the proposed Project will coordinate with stakeholders to schedule work activities, so they do not conflict with major events taking place onshore.

5.4.2.1.2 Housing

The influx of workers to the area, especially during the construction and decommissioning phases, has the potential to create business activity during offseason while only marginally reducing the availability of rental housing and accommodations for tourists.

Mayflower Wind recognizes that infrastructure projects affect local activities during construction and is committed to working cooperatively with state and local officials to minimize impacts on housing availability. The presence of Project workers is expected to affect short-term lodging occupancy only marginally in the area. It is unlikely that the proposed Project will affect the availability of lodging for recreationists and tourists.

5.4.2.1.3 Tourism

Due to the number of ports serving the region, recreational and tourism activities involving vessel charters are not expected to be meaningfully affected during any phases of the Project.

5.4.3 Workforce Hiring

Skilled and unskilled labor is required for all phases of the Project. The Project and its associated Clean Energy Resource will directly and indirectly create and induce an estimated 26,940 full time jobs over the Project's lifetime (with decommissioning) in Massachusetts, and an additional 890 jobs in operations and maintenance will be created in the region. Mayflower Wind will encourage the hiring of personnel from the Project region to fill the required positions. Mayflower Wind will execute a commitment to make at least 75 percent of operations and maintenance local.

Mayflower Wind commissioned BVG Associates to conduct a detailed analysis of the proposed Project's economic development and job creation potential, assuming a 2.4-GW buildout to reflect the full capacity of the Lease Area. Table 5-10 summarizes job creation by the Project and Table 5-11 summarizes job creation across Project phases. A recent report prepared for the New York State Energy Research and Development Authority[28] supports the expected job creation estimates from development of the offshore wind industry in the Northeast.

TABLE 5-10. DIRECT, INDIRECT AND INDUCED JOBS CREATED BY THE PROJECT

	Direct	Indirect	Induced	Total
FTE years created in Massachusetts	14,860	4,300	7,780	26,940
FTE years created in region	15,260	4,530	8,040	27,830

TABLE 5-11. 5JOB CREATION ACROSS PROJECT PHASES

	Development	Construction	O&M	Decomm.	Total
Duration (approximate in years)[a]	6	2	30	2	40
FTE years created in Massachusetts	530	5,760	20,330	310	26,940
FTE years created in region	530	5,760	21,230	310	27,830

Notes:

[a] Durations are based on those used in the modeling of economic development and job creation.

Mayflower Wind has established office space in Fall River and plans to establish an operations and maintenance port in Fall River. Overall employment and economic activity in the Town of Somerset and Fall River will benefit from this Project.

Mayflower Wind is committed to the development of technical and professional expertise within the local and regional workforce throughout the estimated 30-year lifetime of the Project. The training and use of local and regional resources would be prioritized so that the populations concerned by the Project can benefit as much as possible from the direct and indirect economic benefits. This workforce can then contribute to the rapidly growing offshore wind industry in the Massachusetts and Rhode Island area.

There will be opportunities for residents of EJ populations to fill job openings in all phases of the Project. For example, Mayflower Wind and RPS are working together to sponsor and provide local Native

[28] (BVG Associates, 2017)

American communities with cost-free training and all certifications required to work as a Protected Species Observer (PSO). Mayflower Wind employs PSOs on all geophysical survey vessels, who are responsible for keeping watch over a monitoring zone around the vessel to identify protected species including marine mammals and sea turtles, and to initiate measures to avoid negative impacts. PSOs will also be needed to monitor construction activities. Upon successful completion of the program, opportunities for employment as a PSO will be offered through RPS. The first program cohort will be trained in June 2022.

Additionally, to engage the EJ population, Mayflower Wind will maintain a stakeholder engagement plan with outreach and communications mechanisms to share information and gather input from external stakeholders, including regional workforce training providers.

5.4.3.1.1 Construction

Skilled and unskilled labor is required for construction of the Project and the associated Clean Energy Resource. The proposed Clean Energy Resource will directly and indirectly create an estimated 530 jobs (full-time equivalent years) during development and 5,760 jobs during construction in Massachusetts and elsewhere in the region. During construction, the biggest source of Project-related employment in Massachusetts will be from component staging. Construction activities will also provide job opportunities within the marine trades and affiliated industries, including tug and other vessel charters, docking and fueling, vessel servicing, provisioning, and worker transport.

Mayflower Wind is committed to encouraging the hiring of personnel from the Project region to fill the positions required for the various preparation and construction activities. Furthermore, Mayflower Wind is committed to working upstream to aid in the development of a trained workforce for future construction of the proposed Project. The training and use of local and regional resources would be prioritized so that the populations concerned by the proposed Project can benefit as much as possible from the direct and indirect economic benefits. Mayflower Wind has further committed to making at least 75 percent of operations and maintenance jobs local. Mayflower Wind will continue to maintain a stakeholder engagement plan with outreach and communications mechanisms to share information and gather input from external stakeholders, including regional workforce training providers.

Mayflower Wind is committed to hiring skilled and unskilled labor from the region to fill the positions required for the various preparation and construction activities. Construction activities will provide job opportunities within the marine trades and affiliated industries, including tug and other vessel charters, docking and fueling, vessel servicing, provisioning, and worker transport. The biggest source of employment during the construction will be from component staging. The construction phase is expected to add 3,070 jobs in Massachusetts. All these opportunities would be open to EJ populations in the region.

5.4.3.1.2 Operations and Maintenance

Skilled and unskilled labor is required for the operation and maintenance of the proposed Clean Energy Resource. The proposed Clean Energy Resource will directly and indirectly create an estimated 20,330 jobs over its 30 years of operation in Massachusetts, and an additional 900 jobs in operations will be created elsewhere in the region, including Rhode Island.

As for the jobs created during the construction phase, Mayflower Wind will encourage the hiring of personnel from the proposed Project region to fill the required positions.

5.4.3.1.3 Decommissioning

Skilled and unskilled labor is required for the decommissioning of the proposed Clean Energy resource. The proposed Clean Energy Resource will create an estimated additional 310 jobs during decommissioning.

Decommissioning activities will be similar to the construction phase but less intensive. The decommissioning of WTGs and other Project structures, as well as the rehabilitation of sites, will require the hiring of workers, but fewer than during the construction phase. Transporting the dismantled equipment and material would also require the services of local providers in the region. The decommissioning work will generate short-term economic benefits in the region. Following the decommissioning of the proposed Project, the region would lose the permanent jobs necessary during operations.

Overall, the jobs created by the proposed Clean Energy Resource will increase the number of new job opportunities in the area as well as the regional job market. The increase in jobs will be noticed mostly during construction and decommissioning activities. While Project-related jobs will cease after decommissioning, the proposed Project will have contributed to the development of technical and professional expertise within the local and regional workforce throughout the estimated 30-year lifetime of the proposed Clean Energy Resource. This workforce can then contribute to the rapidly growing offshore wind industry in the Massachusetts and Rhode Island area.

5.4.3.1.4 Procurement of Materials, Equipment and Services Including Port Use and Vessel Charter

The Project may affect the Massachusetts economy throughout the entire supply chain of Project-related activities in the communities hosting the proposed Project as well as within the general region, including New Bedford and Fall River.

This Project will benefit the local coastal economies and industries supporting the activities of the proposed Project throughout its life. The construction phase will require the use of the port facilities near staging areas and will require amenities and services for numerous workers, lodging, restaurants, banks, shops, medical services, entertainment, parks, tourism, sports, gas stations, etc. Project expenditures will support existing employment in these economic sectors: increased hours, increased wages and overtime opportunities for workers. The Project will also create new employment opportunities as affected businesses hire more workers. These activities will provide continued or new employment opportunities for EJ populations.

Periodic maintenance and repairs may require equipment, materials, supplies, and services such as vessel provisioning and servicing. These needs will be sourced from within the Project region to the extent feasible. Such activities may include the clearing of vegetation along ROWs, planned replacement of equipment and materials, and the operation of maintenance equipment. These maintenance activities are not expected to adversely affect the general population or potential EJ populations.

Offshore decommissioning activities are expected to be comparable to the construction phase but less intensive, and effects on the procurement of materials and equipment would be similar to, but less significant than, that during construction.

5.4.3.1.5 Planned Discharges - Air Emissions

Construction-related air emissions may affect the communities in the immediate vicinity of the construction activities. Air emissions will mostly be created by vehicles and construction equipment, and

will include carbon monoxide, sulfur dioxide, nitrogen oxides, sulfuric acid mist, particulate matter, etc. Earth moving activities will also create particulate matters (construction dust).

The construction of the Brayton Point onshore export cable route, including the installation of the Brayton Point onshore Project components may temporarily affect neighboring communities, including residents within the vicinity of Brayton Point. However, since Brayton Point is located on an industrial site that has no pedestrian access and the immediate area is unoccupied, this Project would have few effects on air quality.

Overall, Project-related air emissions are not expected to have disproportionately high and adverse impacts on potential EJ populations. The proposed Project will implement best management practices to minimize potential effects. Also, an onshore construction schedule will be developed to minimize effects to neighboring communities to the extent feasible. Onshore construction activities will comply with local regulatory authority requirements.

5.4.3.1.6 Health

Environmental Justice is based on the principle that all people have the right to be protected from environmental pollution, and to live in and enjoy a clean, healthy environment.

In conjunction with the Massachusetts Executive Office of Energy and Environmental Affairs, the Massachusetts Department of Public Health'ss Bureau of Environmental Health have identified four environmentally related health indicators used to identify populations with evidence of higher-than-average rates of environmentally related health outcomes. The Vulnerable Health EJ Criteria are:

1. Heart Attack Hospitalization: 5-year average adjusted rates of hospitalization equal to or greater than 110 percent of the state rate. Exposure to air pollution can increase the risk for heart attack and other forms of heart disease.
2. Childhood Lead Exposure: 5-year average prevalence of elevated (higher than 5 ug/dL) childhood blood lead levels (ages 9 to 47 months) that is equal to or greater than 110 percent of the state rate. Lead exposure disproportionately impacts lower income communities and communities of color. Childhood exposure to relatively low levels can cause severe and irreversible health effects.
3. Low Birth Weight: 5-year average low birth weight rate among full-term births that is equal to or greater than 110 percent of the state rate. Exposure to contaminants can increase the risk of delivering a low-birth-weight baby and is a significant predictor of maternal and infant health.
4. Childhood Asthma Emergency Department Visits: 5-year average of emergency department visits for childhood (5 to 14 years) asthma that is equal to or greater than 110 percent of the state rate.

The Massachusetts Department of Public Health EJ Tool[29] was used to identify possible vulnerable health impacts because of the Project. The Town of Somerset does not meet any of the four health criteria. Further from Brayton Point but still within one mile of the Project, the Town of Swansea and City of Fall River contain EJ neighborhoods where health indicators are elevated.

The Town of Swansea meets the vulnerable health EJ criterion for heart attack (and not the other vulnerable health indicators). Since 2010, the 5-year average age-adjusted rate of hospitalizations for

[29] Massachusetts Environmental Public Health - Bureau of Environmental Health. 2022. "Massachusetts Environmental Public Health Tracking | Environmental Justice." Matracking.ehs.state.ma.us. March 3, 2022. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. Accessed March 3, 2022.

heart attacks is slightly greater than the 110 percent of the state rate (see Figure 5-10). People living in EJ areas with higher-than-average heart attack hospitalization rates may be more vulnerable to adverse environmental exposures. Heart attack hospitalization data is not available below the town level, so it is difficult to ascertain the predominance of heart attack rates within the particular CBGs within the Project one mile study area.

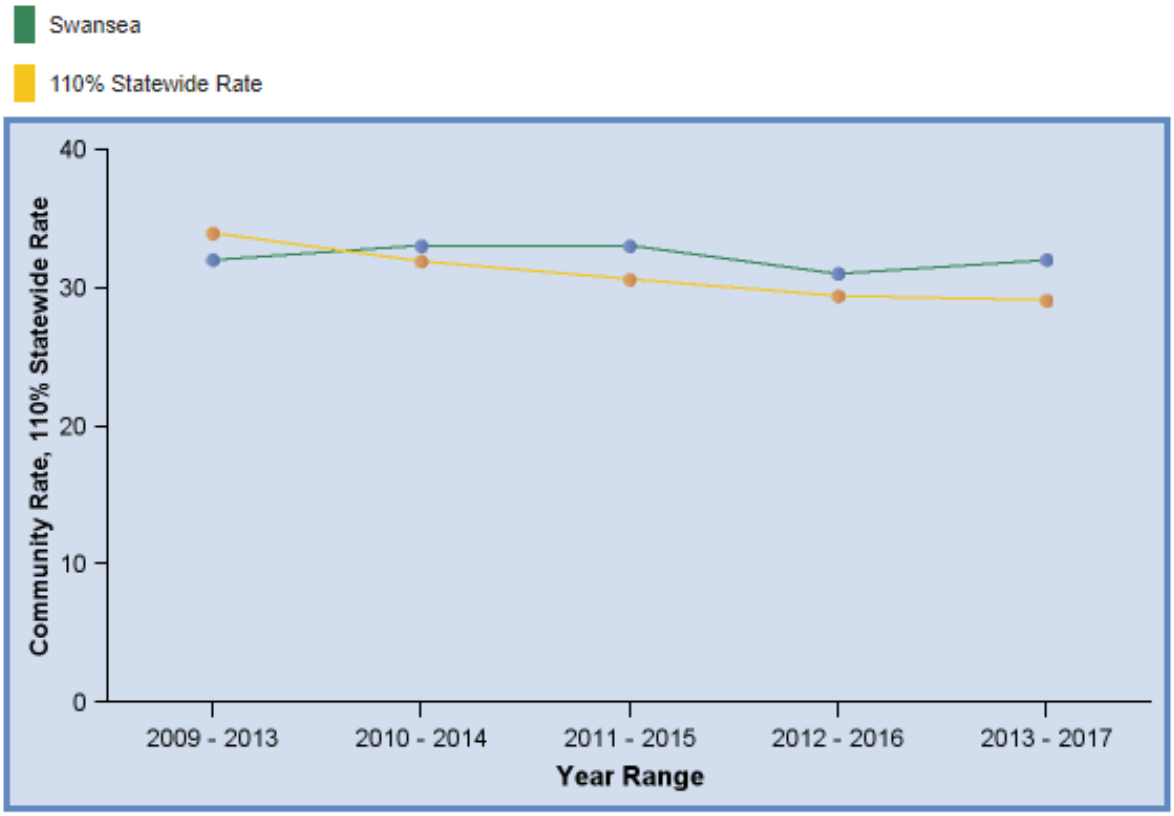

FIGURE 5-10. HEART ATTACK RATE IN THE TOWN OF SWANSEA

Source: Massachusetts Environmental Public Health - Bureau of Environmental Health. 2022. "Massachusetts Environmental Public Health Tracking | Environmental Justice." Matracking.ehs.state.ma.us. March 3, 2022. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. *Accessed March 3, 2022.*

In the City of Fall River, all four vulnerable health EJ criteria are met (see Figure 5-11 below). The rate of heart attacks, low birth weight babies and childhood asthma is higher than 110 percent of the state rate. That said, it is also important to note Mt. Hope Bay separates the Brayton Point site from the City of Fall River. Without Project impacts to air quality, any additional health impacts because of the Project would likely be insignificant.

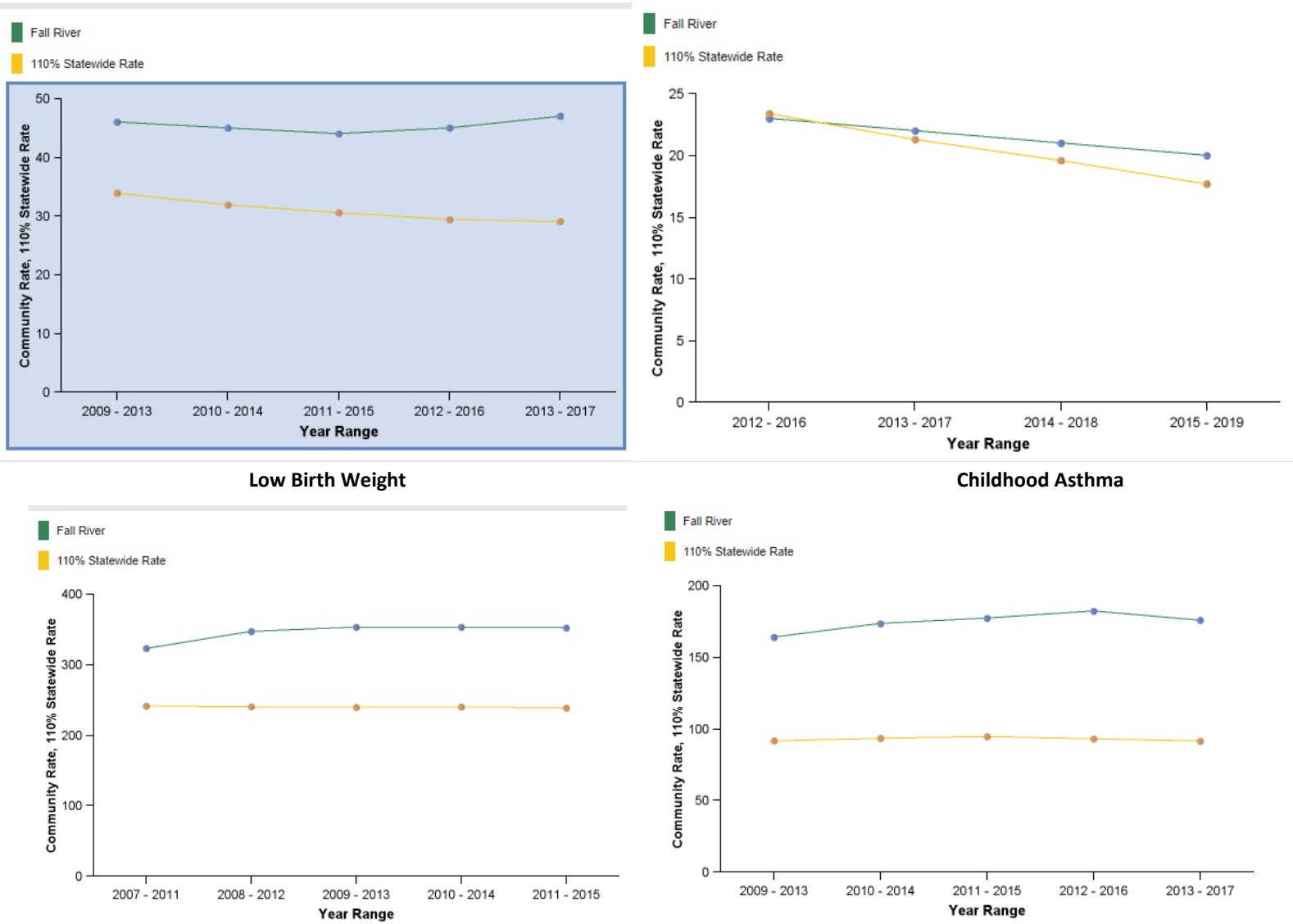

FIGURE 5-11 VULNERABLE HEALTH REPORT FOR THE CITY OF FALL RIVER

Source: Massachusetts Environmental Public Health - Bureau of Environmental Health. 2022. "Massachusetts Environmental Public Health Tracking | Environmental Justice." Matracking.ehs.state.ma.us. March 3, 2022. https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. *Accessed March 3, 2022.*

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The compressor station at Brayton Point is located on a preexisting site of what used to be the largest coal-fired power plant in New England. There are no significant air emissions stemming from the compressor station so the overall impact would be an improvement from when the power plant was still in operation, (1963 to 2017) and no different from after the power plant went offline in June 2017.

5.4.3.1.7 Sea Level Rise

Future sea level projections are provided for the Massachusetts coastline at established tide gauge stations with long-term records in Massachusetts at Boston Harbor, Nantucket, and Woods Hole; and in Rhode Island in Newport. Using the Massachusetts Climate Change Clearinghouse (resilient MA)'s Climate Tool,[30] the expected sea level rise from the closest recording station, at Newport, Rhode Island is projected to rise by 2.4 ft above mean higher high water (see Figure 5-12).

Location Info

Newport, RI

The value highlighted in green is the projected value corresponding to the decade and scenario currently selected on the map. For more information about these sea level rise projections, please review the metadata documentation.

Relative mean sea level (feet NAVD88) for Newport, RI

Scenario	2020	2030	2040	2050	2060	2070	2080	2090	2100
Intermediate	0.4	0.7	1	1.4	1.9	2.4	2.9	3.5	4
Intermediate High	0.6	0.9	1.3	1.8	2.3	2.9	3.6	4.4	5.1
High	0.8	1.3	1.8	2.4	3.2	4.2	5.2	6.5	7.7
Extreme	0.9	1.5	2.2	3.1	4.2	5.5	6.9	8.5	10.3

Source: Resilient MA. n.d. "MA Climate Change Clearinghouse." Resilientma.org. Accessed March 3, 2022. https://resilientma.org/rmat_home/designstandards/.

FIGURE 5-12. SEA LEVEL RISE PROJECTIONS FOR NEWPORT, RI

5.4.4 Engagement and Employment Opportunities

All phases of this Project will provide opportunities for both skilled and unskilled labor from the region. Mayflower Wind will encourage the hiring of personnel from the proposed Project region to fill the required positions, with a further commitment to make at least 75 percent of operations and maintenance jobs local.

Mayflower Wind is committed to developing the local workforce and supply chain. The economic benefits package includes investments in education and workforce development, to support under-represented groups and the local community.

To engage the local community and EJ populations, Mayflower Wind will work with the Director of Environmental Justice to ensure that appropriate measures are taken to address any potential environmental impact this Project may have on the existing EJ population. This interaction will include, but not be limited to identifying applicable languages for the translation of public notices and urging proponents to work with active EJ organizations in the Project's designated area. Collaboration with the Director will ensure that project proponents are aware of the concerns of EJ populations.

[30] https://resilientma.org/rmat_home/designstandards/

Mayflower Wind will maintain a stakeholder engagement plan with outreach and communications mechanisms to share information and gather input from external stakeholders, including EJ populations. In accordance with the Massachusetts Policy, Mayflower Wind will commit to the following outreach efforts:

- Schedule public meetings or hearings at locations and times convenient for neighborhood stakeholders, and in consideration of public transportation availability, and/or through zoom or other similar web-based service.
- Make public notices, environmental notification forms, environmental impact reports, and other key public engagement documents and documents related to the project review available in both English and any other language spoken by a significant number of the affected environmental justice population. These technical materials should be in lay-person language to ensure the community understands the potential impacts of the project and can provide meaningful input.
- Provide translation services at public meetings as appropriate (if a particular language is spoken by more than 10 percent of residents in that census tract) and upon request.
- Door-to-door education efforts through the use of flyers or other canvassing methods.
- Provide appropriate information about the project review procedure.
- Hold pre-application meetings with the local community.
- Use of non-English and/or community-specific media outlets to publicize the project, including local public broadcasting stations, specialized newspapers, community newspapers and social media channels.

On a case-by-case basis:

- Establish one or more local information repositories that are convenient and accessible for the impacted community, as well as provide availability of information online.
- Gather community-specific local media contacts (based on the culture of the community).
- Utilize collaborative approaches to problem-solving, including public deliberation and consensus-building where appropriate, to address public concerns.
- Provide timely notices to neighborhoods potentially impacted by a decision, and clear guidance on applicable grievance/appeal procedures.
- Provide information and assistance to EJ populations regarding grant applications and environmental, energy, or climate change regulations to assist them with compliance and sustainability.

These commitments will help facilitate opportunities for all interested parties to participate.

5.5 CONSTRUCTION CONSIDERATIONS AND METHODOLOGIES

The following section describes construction methodologies for the offshore and onshore export cables including the sequence of construction activities and construction-related topics such as schedule, construction work hours, environmental compliance, monitoring, and mitigation.

The cable installation techniques and methods discussed below have been selected to maximize efficiency while mitigating for potential impacts. The progression of installation is expected to begin with the HVDC converter station site work, followed by the installation of converter station equipment.

5.5.1 Offshore Cable Installation

The proposed Project includes two offshore export power cables and associated communications cabling, which connect the OSPs to the landfall site. The proposed export cable route (including portions in federal, Rhode Island, and Massachusetts jurisdiction) starts from the OSPs within the Lease Area in federal waters and will run through Rhode Island Sound to the Sakonnet River, making intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island, then into Mount Hope Bay where the cables enter Massachusetts state waters to the landfall site at Brayton Point in Somerset. Prior to installation of the offshore export cables, surveys will be conducted utilizing a range of sensors ranging from sonar, sub-bottom profiler, echo-sounder, and magnetometer. Some surveys have already taken place 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, debris, unexploded ordnance, or boulders) 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. Potential impacts associated with installation are addressed in Section 4.6.

5.5.1.1 Seabed Preparation for Cable Installation

The seabed may require preparation, including debris and boulder removal, prior to installing offshore export cables. An orange peel grabber may be used for localized boulder removal and a plow may be used for boulder field removal in case boulders identified during pre-lay surveys cannot be easily avoided by micro-routing within the export cable corridor. 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 safety of the cable installation such as abandoned mooring lines, wires, or fishing equipment.

Mayflower Wind may utilize equipment, as detailed in Table 5-12, to prepare the seabed as described above.

TABLE 5-12. OFFSHORE EXPORT CABLE SEABED PREPARATION EQUIPMENT

Equipment	Use
Grapnel plow	Pre-lay grapnel run
Orange peel grabber	Localized boulder removal
Boulder clearance plow	Boulder field clearance

5.5.1.2 Cable Installation and Burial

Depending on the installation survey findings and seabed conditions encountered, several preparation and installation methods may be utilized. These methods are listed in Table 5-13 and described below. These cable laying techniques can involve cable laying followed by burial and/or simultaneous cable installation and burial.

TABLE 5-13. OFFSHORE EXPORT CABLE INSTALLATION AND BURIAL EQUIPMENT

Equipment	Use
Jetting sled / plow	Shallow water uses for deeper trench depths (surface fed water supply) in areas of prepared/benign seabed surfaces
Jetting Remote Operated Vehicle (ROV)	Typically used in deeper water and can be used for unconsolidated soft beds

Equipment	Use
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	Vessel mounted burial solution for shallow water use that allows deep burial and does not require seabed/sand wave sea leveling

5.5.1.3 Jetting Sled / Plow

A jetting sled / plow 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 offers sufficient maneuverability for any curves that the proposed offshore export cables may be laid in.

5.5.1.4 Jetting Remotely Operated Vehicle

The jet trencher is an ROV based system that can be launched from cable installation vessels or from a dedicated support vessel. This self-propelled jetting method is capable of lowering the cable to depths of up to approximately 9.8 ft (3.0 m). This method is typically used in non-consolidated soils.

5.5.1.5 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.

5.5.1.6 Mechanical Plow

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

5.5.1.7 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 and is anticipated for use along the export cable route to the Lease Area. 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.

5.5.1.8 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.

5.5.1.9 Anchoring

It is expected that a combination of a moored vessel solution and a Dynamic Positioning 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 Dynamic Positioning 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 Dynamic Positioning 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. The maximum anchor radius from the cable installation barge will be approximately 2,625 to 3,281 ft (800 to 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 ECC.

Because the portion of the ECC within Massachusetts state waters is primarily in shallow water, it is expected that a moored vessel solution will primarily be employed.

5.5.1.10 Cable Protection

The primary objective is to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire cable route, by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. Cable protection is typically required at 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 soils to allow the cable to further settle into the trench. 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. Scour protection may also be used.

Based on preliminary understanding of site conditions from geophysical and geotechnical surveys completed in 2019, 2020, and 2021, Mayflower Wind estimates up to 15 percent of the ECC will require secondary cable protection.

Any required crossings of third-party cables and/or pipelines 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.

No offshore crossings are currently anticipated along the Project routes within Massachusetts State Waters.

5.5.2 Cable Landfall

5.5.2.1 Trenchless Technology

HDD will enable cable installation to pass beneath the nearshore area, while avoiding impacts to coastal habitat. Thus, Mayflower Wind has chosen to use HDD methods to bring the offshore export cables to the TJBs onshore. 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.

Installation of the landfall facilities associated with the HDD will include the use of onshore excavation and construction equipment and HDD support equipment. Construction related to the landfall site is expected to include the following:

- Construction of a temporary approach pit at a previously disturbed site at each onshore HDD entrypoint.
- Drilling of a pilot hole along each planned HDD trajectory, below the beach and intertidal zone, andreaming of the bore hole to the necessary diameter.
- Construction of a temporary approach pit or structure (e.g., cofferdam, gravity cell) at the offshore HDD exit point may be required to support HDD construction.
- 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 concrete TJBs underground onshore.
    - 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 Brayton Point 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 58 ft (17.5 m) below the seabed. HDD bores will be separated by a distance of approximately 10 – 20 ft (3 – 6 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.

The Project includes installation of two conduits via HDD as well as corresponding offshore export power cables and associated communications cabling for delivery of 1,200 MW. The Noticed Variation includes the installation of an additional two spare conduits via HDD for an additional circuit.

5.5.2.2 Transition Joint Bays

The offshore export cables will be spliced with the onshore export cables within TJBs installed underground at landfall locations at Brayton Point.

TJBs are cast-in-place or precast concrete underground vaults estimated to be 30 L x 10 W x 8 H feet (ft) (9.0 x 3.0 x 2.4 meters [m]). The purpose of a TJB is to provide a clean, dry environment for the splicing of the offshore export cables to the onshore export cables, as well as to protect the completed splice. The sheaths from the offshore export power cable and the onshore export power cable will be terminated into the link box in the TJBs. Access to the TJBs is obtained via manhole covers installed at grade. The fiber optic communications cable will be joined inside the communications handhole installed adjacent to the TJB with its own access cover.

Each TJB can accommodate jointing for one to two power cables, which is driven by site-specific considerations with respect to how the vaults and cables can be configured spatially. The Project includes 1-2 TJBs, and the Noticed Variation includes an additional one to two TJBs as spare vaults for an additional circuit.

5.5.3 General Construction Methods for Underground Cable Installation

Construction of the onshore underground export cable system for the HVDC export cables and the underground HVAC transmission lines is anticipated to consist of the following stages:

- Install soil and erosion controls and other mitigation measures, as appropriate.
- Saw cut pavement and/or concrete and trench/excavate, in preparation of setting duct bank.
- Install conduits and spacers in the trench, form the duct bank, and pour the concrete.
- Install safety tape on top of the duct banks.
- Set manholes, as appropriate.
- Backfill the excavated trench and perform surface restoration.
- Cable pulling through the conduits, splicing of the cables, and testing.

Each of these phases is described in more detail below. The phases will be conducted in sequence at each location. Mayflower Wind anticipates that several phases of construction will be ongoing simultaneously along different sections of the route. Construction at the HVDC converter station will take place concurrently with the installation of the new onshore export cables.

5.5.3.1 Onshore HVDC Export Cable System

The Project includes installation of conduits that can accommodate two +/- 320 kV HVDC export power cables and associated communications cabling in a single trench. At each location requiring the splicing of onshore power cables, one splice vault and one communications handhole are planned.

The Noticed Variation includes the installation of conduits that can accommodate four power cables and associated communication cabling in a single trench. At each location requiring the splicing of onshore power cables, two splice vaults and two communications handholes would be installed. Along the duct bank route, the excavated trench area would have similar dimensions to what is required for the Project (i.e., without the spare conduits). The work area at cable splicing locations would be increased to accommodate the installation of the additional splice vault and communications handhole. The Noticed Variation only applies to the export cable system and terminates upon reaching the HVDC converter station site.

5.5.3.2 HVAC Interconnection Cable System

The HVAC interconnection cable system consists of conduits and power cables for three +/- 345-kV HVAC circuits to deliver 1,200 MW to the POI. Each circuit could be designed with two cables per phase (requiring a total of six power cables) or with three cables per phase (requiring a total of nine power cables). Preliminary engineering has identified a configuration of two cables per phase as preferrable because it simplifies termination at the POI.

Mayflower Wind will obtain coverage for the Project under the National Pollutant Discharge Elimination System Construction General Permit and develop and maintain a Stormwater Pollution Prevention Plan for the Project that will identify controls to be implemented to mitigate the potential for erosion and sedimentation from soil disturbance during construction. Prior to initiating construction, proper

erosion/sedimentation control devices, such as straw or hay bales and siltation fencing, will be installed in accordance with approved plans and permit requirements (e.g., wetlands protection Orders of Conditions), with oversight by Mayflower Wind's construction supervisor. Weekly inspections to evaluate potential erosion and/or sedimentation issues will be conducted until final stabilization (i.e., 75 percent vegetative cover within the disturbed areas, road repaving) has been achieved. Photographic documentation will also be obtained.

In instances where work within the roadway will be conducted adjacent to storm drains, Mayflower Wind will install and maintain filter fabric barriers to prevent sediment from entering the storm drain system. When construction is complete at each location and the roadway has been re-paved, the filter fabric barriers will be removed.

5.5.3.3 Duct Bank and Splice Vault Installation

Mayflower Wind anticipates installing onshore cables in a concrete-encased duct bank, as shown in the preliminary engineering plans provided in Attachment B. Alternatively, the conduits may be installed by directly burying them without the concrete encasement, where suitable.

Installation of the onshore conduit system will use open-cut trenching methods where practicable. 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.

An excavator or backhoe will excavate a trench along the proposed duct bank alignment. Trench boxes or other typical safety measures will be used to shore up the excavation while conduits are laid and concrete is poured and cured. In areas without subsurface obstructions such as existing utilities, it may be feasible to install stretches of pre-cast concrete duct bank instead of a cast-in-place system.

Duct bank construction is expected to progress at a rate of 50 to 100 ft (15 to 30 m) per day, with the rate of progress depending on a variety of factors including the density of existing underground utilities. Trench excavation is anticipated to be approximately 5 to 6 ft (1.5 to 1.8 m) wide with the use of trench boxes. The target excavation depth will be approximately 6.0 ft (1.8 m) deep but could be deeper depending on survey results and potential utility crossings. Once the open trench is prepared, the conduits will be assembled and lowered into the trench. The area immediately around the conduits will be filled with high strength thermal concrete (3,000 psi) to protect the conduits, the trench backfilled, and the surface restored. Attachment C provides photographs of representative construction sequencing.

Splice vaults or direct buried splice pits will be placed at the required location along the route, per the final design. The approximate spacing of splice vaults is every 0.3 mi (0.5 km) based on the geometry of the route and the physical properties of the cables. Several factors contributing to the distance between splice vaults, including allowable pulling tensions, sidewall bearing pressure on the cable as it goes around a bend, the maximum length of cable that can be transported on a reel based on the reel's width, height, and weight, and the allowable voltage rise on the cable shield.

Like TJBs, splice vaults provide a clean, dry environment for the jointing of segments of onshore export cable. The fiber optic communications cables will be joined inside the communications handhole installed adjacent to the splice vaults with its own access cover. After completion of trenches, duct banks, and vaults or pits, cable installation and pulling operations will be performed.

5.5.3.4 *Onshore Cable Installation and Testing*

Following the installation of the splice vaults and duct bank as described above, the ducts will be swabbed and proofed to prepare for cable pulling activities. Typical equipment used for cable installation includes a winch, cable reel cart, box trucks, splicing and terminating tools, and other miscellaneous tools. To install each cable section, first the splice vaults will be dewatered using temporary sump pumps. Then a cable reel will be set up at the pull-in splice vault and a cable puller will be set up at the pull-out splice vault, via the manholes. A hydraulic cable pulling winch and tensioner will be used to individually pull cable between splice vaults. This process will be repeated until all cables have been installed.

Once adjacent cable sections are installed, they will be spliced together inside the splice vaults. The splicing operation requires a splicing van and a generator, which typically will be located over one manhole access. The splicing van contains all of the equipment and material needed to make a complete splice. Once the complete cable system is installed, it will be field-tested. At the completion of successful testing, the line will be energized.

5.5.3.5 *Dewatering*

Although not expected, high groundwater conditions may be encountered during construction. Areas where groundwater may be encountered will be identified as part of the pre-construction environmental investigation of soils. Water found in all excavations must be assessed for obvious signs of contamination (e.g., discoloration, odor, signs of oil) prior to discharge. If feasible, the least costly method when dewatering will typically be to recharge the groundwater back into the adjacent subsurface based on site-specific conditions. This can be accomplished by discharging groundwater back within the open excavation associated with the project/pipe installation or discharging to the nearby ground surface via a filter bag or dewatering corral (if necessary), allowing groundwater to infiltrate back into the soil. For situations where on-site recharge of groundwater is not an option, such as when water exhibits signs of contamination, the water will typically need to be pumped by a waste management contractor for proper off-site disposal.

5.5.3.6 *Laydown and Staging*

Laydown and staging areas will be established prior to the commencement of construction activities. Where feasible, these areas will be located more than 100 ft (30 m) from wetland resource areas and more than 200 ft (61 m) from perennial waterways. If these setback distances are not feasible to achieve, secondary containment measures and sedimentation/siltation control measures will be installed by the construction contractor.

5.5.3.7 *Construction Equipment and Refueling*

It is anticipated that vehicle fueling will be performed off-site at commercial service stations, and all major equipment maintenance will be performed offsite, likely at the contractor's base of operations. It will be necessary to refuel large equipment, such as excavators and paving equipment, on-site. Any such field refueling will not be performed within 100 ft (30 m) of wetlands or waterways, or within 100 ft (30 m) of known private or community portable wells. The Project is not located within a Town water supply Zone 1 area, and as such no vehicle or equipment refueling will occur within a Zone 1 area.

Construction equipment and vehicles will be equipped with a spill containment kit and absorption materials, and additional spill containment equipment will be maintained on site for immediate use in the event of any inadvertent spills or leaks. All equipment operators will be trained in the use and deployment of spill containment materials.

All equipment will be inspected for incidental leaks (e.g., hydraulic fluid, diesel fuel, gasoline, anti-freeze) prior to site access and on a daily basis at the commencement of each work shift. Mayflower Wind will require documentation of all daily inspections as part of the contractor's approved means and methods.

5.5.4 HVDC Converter Station Civil Works and Construction

The HVDC converter station will be constructed within the central interior of the Brayton Point property. The site to be operated and maintained by Mayflower Wind will be approximately 8-10 ac, and within the parcel, approximately 7.5 ac will be redeveloped for the HVDC converter station that will both be enclosed within a perimeter security fence and have a separate access.

The HVDC converter station yard will include the following representative list of major components and equipment: (i) HVDC converter station steel building (~65 ft [20 m]) in height); (ii) current transformers; (iii) voltage transformers; (iv) circuit breakers; (v) auxiliary transformer (on concrete pad); (vi) backup power generator (emergency generator lighting and alarms at the facility, on concrete pad); (vii) control building (to house electrical components); (viii) storage building; (ix) spare transformer (on concrete pad); (x) water tank (for cooling recirculating cooling system); (xi) oil/water separator; (xii) AC transformers (3 – 320 kV units); (xiii) steel overhead busbar (on concrete foundations or slabs); (xiv) cooling towers; (xv) station service transformers; (xvi) V/AC (for building climate control); (xvii) ~85 ft (26 m) lightning mast; (xviii) stormwater management system; and (xix) access, parking area and laydown area.

All oil-containing equipment on-site will include secondary containment. The emergency generator will be installed with secondary containment. The transformers will arrive and be installed within built-in secondary containment. Portions of the converter station yard will be paved to allow for accessibility by vehicles and personnel. Much of the HVAC AIS yard will receive a surface treatment of stone and rip-rap. A separate stormwater management system will be designed and constructed to collect, detain, treated and discharge stormwater collected on-site. The stormwater will ultimately be connected to the storm drainage system that exists at the Brayton Point site.

The construction of the HVDC converter station facility will generally involve the following construction sequence:

- Site preparation
    - Field survey
    - Install soil erosion and sediment controls
    - Grading
    - Import of engineered fill
    - Export of material deemed unsuitable for providing structural support to the proposed facilities. Mayflower will work with the landowner to reuse material onsite where practicable.
    - Install crushed stone tracking pads at entrances onto the site
- Yard construction
    - Establish yard elevation(s)
    - Remove any excess rock or shallow bedrock
    - Install new ground grid apron
    - Spread clean processed gravel and aggregate to improve grounding and drainage
    - Install security fence around the perimeter of the converter station yard
    - Construct the storm water management system

  - Connect a new water line
  - Install a new tight tank for wastewater
  - Pave new entrances, accessways and parking areas
- HVDC converter station building and yard equipment
  - Drill and install concrete foundations and slabs to support the buildings and heavier loads
  - Erect the steel HVDC converter station building, control building and storage building
  - Construct the overhead buswork
  - Install the transformers
  - Connect the electrical components in the converter station building and AIS yard
  - Construct sound walls around noise producing sources (if required)
  - Install the water tank
  - Erect the cooling tower(s)
- Final restoration
  - Site stabilization and revegetation
  - Removal and proper disposal of construction-generated debris
  - Final cleanup and stabilization of stormwater management system
  - Final paving
- Testing and commissioning

The HVDC converter station will be constructed in conformance with Northeast Power Coordinating Council protection standards.

5.5.4.1.1 Construction Waste and Soil Management

Mayflower Wind proposes to recycle as much material as possible. Materials not salvaged and any debris that cannot be recycled will be removed from the site to an approved off-site facility. Handling of such materials will be performed in compliance with applicable laws and regulations.

Waste materials generated along the route during installation of the HDD, transmission duct bank, and vaults will be removed and re-used or properly disposed of at a suitable facility. The largest quantity of construction waste will be from soils excavated from the trench and locations where splice vaults are installed. This material will be removed from the trench and hauled to an appropriate on-site or off-site disposal/re-use location or to a temporary construction laydown area for on-site re-use. Concrete and asphalt will be recycled at a local asphalt plant.

The contractor(s) working at the site will be required to submit emergency response plans detailing their methods for containment of oil and hazardous materials including spill response, containment, control, clean-up and reporting to the MassDEP, as appropriate. The contractors will be required to properly label and store oil and hazardous materials to include providing secondary containment. A separate Spill Prevention, Control and Countermeasures Plan will be developed for the HVDC converter station.

Soils that are excavated from on-site or materials imported onto the site will be properly managed and handled by the contractor. Construction laydown areas will be identified including areas for soil stockpiling. Soil stockpiles will be clearly labeled as to their place of origin and encompassed with erosion controls. Finer-grained materials will be properly covered to reduce wind-blown dust. Any potentially contaminated soil will be placed onto and covered with thick polyethylene sheeting and kept separate from other stockpiled materials. Soils that are saturated or otherwise require decanting prior to transport will be handled appropriately to avoid migration of sediment-laden water from migrating to nearby catch basins, resource areas or existing access roads.

In the event there are contaminated soil or other regulated materials encountered along the route, soils will be managed pursuant to the Utility Release Abatement Measure provisions of the Massachusetts Contingency Plan (310 CMR 40.0000 et seq.), the Chapter 21E regulations. Mayflower Wind will contract with a licensed site professional as necessitated by conditions encountered along the Project alignment, consistent with the requirements of the Massachusetts Contingency Plan at 310 CMR 40.0460 et seq.

5.5.4.1.2 Activity and Use Limitation Areas

The northern portion of the property at Brayton Point was historically utilized for ash management, housed cooling towers, and contained portions of the wastewater treatment system for the generating facility. The HVDC converter station site is located in an Ash Management Area that supported generating station operations. A series of lined landfill cells, numbered from Cell 1 and Cell 1A to Cell 10A, were then constructed to receive coal ash and oil ash solids dredged from Basins No. 1 and 2 in late 1979 or early 1980. The Site is located east of Cell 1A. Cell 1A was used for emergency storage of materials.

Cell 1A and the surrounding area are a MassDEP disposal site tracked by Release Tracking Number 4-13169, as shown in Figure 1-7. A Class A-3 Response Action Outcome Statement and associated Activity and Use Limitation (AUL) (collectively a Permanent Solution Statement) was submitted to MassDEP in October 2012 for Cell 1A. The AUL recorded in the Registry of Deeds for this Release Tracking Number describes permitted and prohibited site activities and uses, including provisions for soil management within Cell 1A. Brayton Point LLC is now planning to conduct Post-Permanent Solution response actions at the Property to manage soils in the AUL areas as part of Property-wide redevelopment activities. These response actions will be performed in accordance with the AULs and under Phase IV Remedy Implementation Plan (Tier II Classification Extension Submittal for Landfill Cell 1A and Former Generator Areas, GEI, February 18, 2021).

The converter station site is partially bounded to the west by AUL Cell 1A area (Figure 1-7). The HVDC converter station has been designed and will be constructed to avoid impact the AUL, if the AUL is not relocated prior to Mayflower Wind's commencement of construction. The stormwater management design and storm management area have been designed to avoid direct point discharge towards or into the boundary of the AUL. Appropriate measures will be implemented by Mayflower Wind's construction contractor to avoid encroachment into or impact to the AUL.

5.5.5 Construction Hours and Schedule

Construction hours will be developed in accordance with local noise ordinances and municipal regulated construction hours. For the installation of the onshore duct bank and splice vaults, construction is anticipated to occur during typical work hours (7:00 a.m. to 10:00 p.m.), Monday through Friday. Construction required for the installation of the underground transmission system may occur outside of this time period under certain circumstances, such as when transmission cables are being spliced, and Mayflower Wind will work closely the Town of Somerset to seek approval when work outside of these hours is necessary. Mayflower Wind will also coordinate with the Town to determine areas where construction hours will be limited. In certain locations, night work may be proposed to allow advancement of Project construction in areas with onsite traffic congestion or other construction projects being advanced simultaneously. Mayflower Wind will coordinate with the Town of Somerset to establish construction hours.

For work at the landfall site, the proposed HDD construction work hours are typically from 7:00 a.m. to 7:00 p.m. on Monday through Saturday. Mayflower Wind will work closely the Town of Somerset to seek approval for when work outside of these hours is necessary.

5.5.6 Construction Mitigation, Compliance and Monitoring

Construction mitigation measures will help mitigate the potential for temporary impacts to the human and natural environments. Typical mitigation for dust, minimizing construction vehicle emissions, and performing construction compliance inspections are discussed below for underground transmission line construction. Specific discussions for stormwater runoff and associated erosion and sedimentation are discussed above in Section 5.5.3.1.

5.5.6.1 Air Quality

For the underground transmission system construction, dust will be controlled at the construction sites by use of appropriate methods, including the use of dump trucks to move soil out of the construction zone, and by covering temporary soil stockpiles.

Mayflower Wind may also require contractors to place water trucks with misters in or near the work areas during construction activities. In addition, Mayflower Wind will direct its contractors to retrofit any diesel- powered non-road construction equipment rated 50 horsepower or above to be used for 30 or more days over the course of the Project with USEPA-verified (or equivalent) emission control devices (e.g., oxidation catalysts or other comparable technologies). Mayflower Wind will also require contractors to use ultra-low sulfur diesel fuel in their diesel-powered construction equipment used for this Project.

Ultra-low sulfur diesel has a maximum sulfur content of 15 ppm as opposed to low sulfur diesel fuel, which has a maximum sulfur content of 500 ppm. The use of ultra-low sulfur diesel fuel results in a 97 percent reduction in the sulfur content as compared to low sulfur diesel fuel. Mayflower Wind will also require its contractors to comply with state law (G.L. c. 90, § 16A) and MassDEP regulations (310 CMR 7.11(1)(b)), which limit vehicle idling to no more than five minutes. There are exceptions for vehicles being serviced, vehicles making deliveries that need to keep their engines running and vehicles that need to run their engines to operate accessories. There may be other times when idling is permitted as long as the idling is absolutely necessary (e.g., as a matter of safety).

In regard to the enforcement of the idling restrictions, it is the responsibility of every person on a job site to be in full compliance with all safety and environmental rules and policies. Supervisors and foremen at job sites are responsible for enforcement of these rules on a continuous basis. There also will be installation of anti-tracking pads and regular sweeping of the pavement of adjacent roadway surfaces during the construction period to mitigate for the potential for construction traffic to kick up dust and particulate matter.

5.5.6.2 Onshore Noise Mitigation

During construction, Mayflower Wind will require that construction comply with the Somerset noise ordinance. Mayflower Wind will mitigate construction noise by:

- Implementing temporary noise barriers at HDD locations where practicable and safe.
- Maintaining equipment with functioning mufflers.
- Requiring continuous noise sources such as generators and compressors will be located away.
- from residential properties to the best of their ability and have enclosed mufflers.
- Using a low-noise generator to reduce noise impacts.
- Requiring compliance with the Massachusetts Anti-Idling Law.

5.5.6.3 Environmental Inspections

Throughout the construction process, Mayflower Wind will retain the services of an environmental monitor to maintain compliance with all federal, state, and local permit requirements. It is anticipated that the monitor will conduct inspections at regular intervals and during periods of prolonged precipitation to verify that environmental controls are functioning properly and to make recommendations for correction or maintenance. If necessary, documentation identifying deficiencies of erosion control measures will be forwarded to the construction supervisor for implementation of immediate corrective measures. The environmental compliance manager will have immediate access to a Company contact and will have stop work authority relative to environmental non-compliance.

In addition to retaining the services of an environmental monitor, Mayflower will require the construction contractor to designate the Construction Supervisor or equivalent to be responsible for daily inspection to confirm that the Project is compliance with permit requirements. Mayflower Wind will also contract with a Massachusetts licensed site professional as necessitated by conditions encountered along the Project, consistent with the requirements of the Massachusetts Contingency Plan.

5.5.7 Safety and Public Health Considerations

Mayflower Wind will design, build, and maintain the Project so that the health and safety of the public are protected. This will be accomplished through adherence to all applicable federal, state, and local laws and regulations, and industry standards and guidelines established for protection of the public. More specifically, all design, construction and operation activities will be in accordance with applicable government and industry standards such as the Massachusetts Code for the Installation and Maintenance of Electric Transmission Lines (220 CMR §§125.00 et seq.) and the National Electrical Safety Code and Occupational Safety and Health Administration regulations. The facilities will be designed in accordance with sound engineering practices using established design codes and guides published by, among others, the DPU, the Institute of Electrical and Electronic Engineers, the American Society of Civil Engineers, the American Concrete Institute, and the American National Standards Institute. The contractor will be required to comply with all Dig-safe regulations and protocols. Following construction of the facilities, all transmission structures and substation facilities will be clearly marked with warning signs to alert the public to potential hazards.

5.6 CONCLUSION

Mayflower Wind will avoid or minimize potential impacts from installation of offshore export cables within the offshore ECC as well as onshore construction of the Preferred or Noticed Alternative Routes and their associated Noticed Variation, to the maximum extent practicable. While either the Preferred or Noticed Alternative Route would satisfy the Project need, the documentation provided in this Section demonstrates the clear advantages of the Preferred Route over the Noticed Alternative. Several advantages of the Preferred Route over the Noticed Alternative Route include:

- Fewer potentially affected residential uses.
- Fewer traffic disruptions.
- Fewer disruptions to the landowner and to the electric transmission company uses of the site.
- Avoidance of dredged channels offshore.
- Shorter offshore route length.

The proposed onshore transmission system will be buried on previously disturbed private property. Regarding traffic management, Mayflower Wind will closely coordinate with the Town of Somerset to address traffic management during construction. Regarding visual impact, as the Project is located in a previously disturbed, industrial area at Brayton Point, no tree clearing nor any significant removal of vegetation is anticipated for the Project. The onshore Project area features would be screened to such a degree it would be practically indiscernible to even highly engaged viewers.

Regarding noise impact, to the extent practical for the Preferred and Noticed Alternative Routes, construction will comply with the noise ordinances in the Town of Somerset. The operational noise produced by the converter station is expected to meet the MassDEP requirement of being no more than 10 dB(A) greater than ambient noise levels at any inhabited buildings near the property for sound produced by the facility during its 24-hour operation.

Regarding EMF, electric fields are not an applicable concern for the proposed cables and predicted HVDC and 60-Hz HVAC magnetic fields are well below health-based exposure guidelines.

Accordingly, the environmental impacts associated with the Project have been properly mitigated.

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6 CONSISTENCY WITH THE POLICIES OF THE COMMONWEALTH

This section describes the Project's consistency with current applicable health, environmental protection, resource use and development policies of the Commonwealth of Massachusetts. The Project is fully consistent with these policies, as explained in further detail below.

6.1 INTRODUCTION

Pursuant to G.L. c. 164 § 69J, the MA EFSB shall approve a petition to construct a facility upon a finding, among others, that the proposed plan is "consistent with the current health, environmental protection, and resource use and development policies as adopted by the Commonwealth." As discussed below and in more detail throughout the Analysis, the Mayflower Wind Project satisfies the requirements of G.L. c. 164, § 69J, and it is also consistent with and directly advances important state energy policies as set forth in *An Act Relative to Restructuring the Electric Utility Industry in the Commonwealth* ("The Restructuring Act") (c. 164 of the Acts of 1997), *An Act Relative to Green Communities* ("The Green Communities Act") (c. 169 of the Acts of 2008), *The Global Warming Solutions Act* (c. 298 of the Acts of 2008), *An Act to Promote Energy Diversity* (c. 188 of the Acts of 2016), *An Act to Advance Clean Energy* (c. 227 of the Acts of 2018, § 21), and *An Act Creating A Next-Generation Roadmap For Massachusetts Climate Policy* ("2021 Climate Act") (c. 8 of the Acts of 2021). The Project is also consistent with the health and environmental protection, resource use and development policies of the Commonwealth, as articulated herein.

6.2 HEALTH POLICIES

An adequate and reliable supply of energy is critical to the state's citizens and economy, as recognized by the Restructuring Act of 1997 which provides that reliable electric service is of "utmost importance to the safety, health and welfare of the Commonwealth's citizens and economy…." The Mayflower Wind Project will, through the transmission infrastructure proposed in this Petition, enable the delivery of approximately 1,200 MW of renewable clean energy from the Mayflower Wind Clean Energy Resource to the Commonwealth of Massachusetts and the regional grid, thus helping to ensure the availability of clean energy supply and reliable electric service to the citizens and businesses of the Commonwealth and the region. The Project will be consistent with, and will promote, the Commonwealth's energy and environmental policies, and it will also be consistent with its health policies.

The Project will be designed, built, operated, and maintained so that the health and safety of the public are protected. As discussed in Section 5, all design, construction, and operation activities will be in accordance with the applicable federal, state, and local regulations, and industry standards and guidelines established for protection of the public, such as the National Electrical Safety Code and Occupational Safety and Health Administration regulations to ensure that the health and safety of the public are protected. As discussed in Section 5, the Project is being designed in a manner to avoid and/or mitigate potential impacts related to traffic, noise, air and water quality, and EMF. Following construction of the facilities, all above-ground transmission structures and substation facilities will be clearly marked with warning signs to alert the public to potential hazards.

6.3 ENVIRONMENTAL PROTECTION POLICIES

The Project is driven by, is fully consistent with, and advances the Commonwealth's and the region's environmental protection and energy laws and related policies, as described below.

6.3.1 The Green Communities Act, as amended by An Act to Promote Energy Diversity and An Act to Advance Clean Energy

In 2016, the Commonwealth enacted legislation that aimed to develop offshore wind energy generation projects by means of competitive solicitations by the Massachusetts EDCs.[1] Section 83C of the *Green Communities Act* (c. 169 of the Acts of 2008), as amended by *An Act to Promote Energy Diversity* (c. 188 of the Acts of 2016) ("Section 83C"), established a budding commercial-scale offshore wind industry in Massachusetts by directing procurement of cost-effective long-term contracts for 1,600 MW of offshore wind energy. Signed by Governor Baker in August 2016, Section 83C required the first solicitation for offshore wind energy to take place no later than June 30, 2017.

In addition, *An Act to Advance Clean Energy* (c. 227 of the Acts of 2018, § 21), authorized the DOER to: (1) investigate the necessity, benefits and costs of requiring the EDCs to conduct solicitations and procurements for an estimate 1,600 MW of additional offshore wind; and (2) evaluate the previous solicitation and procurement process and make recommendations for any improvements.[2] The DOER's study showed that an additional procurement for 1,600 MW of offshore wind energy has "a likelihood of cost-effectiveness that justifies additional solicitations," as such a procurement could result in over 6,000,000-MW hours of annual clean energy when fully operational.[3]

On May 23, 2019, the Massachusetts EDCs, in coordination with the DOER, issued a solicitation for Long-term Contracts for Offshore Wind Energy Projects pursuant to Section 83C.[4] The solicitation sought to procure at least 400 MW, and additional estimated 800 MW, of offshore wind energy generation. Project developers, including Mayflower Wind, submitted bids in August 2019.[5] Following a bid evaluation process, including monitoring and assistance by an Independent Evaluator, the EDCs selected Mayflower Wind's 804 MW proposal as the winning bid on October 30, 2019.[6] On January 10, 2020, the EDCs and Mayflower Wind executed the long-term PPAs. On February 10, 2020, the PPAs were filed for approval with the DPU in Docket Nos. DPU 20-16, DPU 20-17, and DPU 20-18. By order dated November 5, 2020, the Department approved the PPAs. The Project and its delivery of energy from the Clean Energy Resource will be another significant step forward in meeting Massachusetts' and the region's growing demand for clean energy and response to climate change.

On May 7, 2021, a third offshore wind solicitation was issued by the EDCs in accordance with the authority granted to DOER under Section 83C to procure an additional estimated 1,600 MW of aggregate nameplate capacity not later than December 31, 2035 ("83C III").[7] On September 16, 2021, Mayflower Wind submitted multiple bids in response to the 83C III offshore wind solicitation, the public version of which became available on September 23, 2021.[8] On December 17, 2021, Mayflower Wind was selected as the winning bidder for a 400 MW PPA by the Commonwealth of Massachusetts. Combined with the earlier 804 MW award from the 83C II solicitation, Mayflower Wind is now set to

[1] *An Act Relative to Green Communities.* Section 83C, St. 2008, c. 169, as amended by St. 2016, c. 188, § 12.
[2] Massachusetts Department of Energy Resources (DOER). Offshore Wind Study, at 1. May 2019. Available at: https://www.mass.gov/doc/offshore-wind-study/download.
[3] DOER. Offshore Wind Study, at 5-6. May 2019. Available at https://www.mass.gov/doc/offshore-wind-study/download.
[4] This was the second of three solicitations that have been held pursuant to the authority granted under Section 83C, referred to as "83C II". Information on the solicitation process is available at https://macleanenergy.com/83c-ii/83c-ii-documents/.
[5] Information on the bids is available at https://macleanenergy.com/83c-ii/83c-ii-bids/.
[6] Massachusetts Executive Office of Energy and Environmental Affairs (EEA). 2019. Press Release: Project Selected to Increase Offshore Wind Energy in the Commonwealth. October 30, 2019. Available at https://www.mass.gov/news/project-selected-to-increase-offshore-wind-energy-in-the-commonwealth.
[7] Information on the solicitation process is available at: https://macleanenergy.com/83c-iii/.
[8] Information on the bids is available at: https://macleanenergy.com/83c-iii/83c-iii-bids/.

provide more than 1,200 MW of clean energy to customers throughout Massachusetts and New England.

Given the directives in Section 83C, the Project and its associated Clean Energy Resource satisfy Massachusetts' and the region's growing need for offshore wind energy projects. By delivering an estimated 1,200 MW of low-cost, renewable clean energy from the Clean Energy Resource, the Mayflower Wind Project furthers the clean energy mandates established by legislation in Massachusetts and neighboring New England states. The Project will help meet the clean energy needs of the Commonwealth and the region and will provide substantial environmental and economic benefits.

6.3.2 An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy (2021 Climate Act)

In 2021, the Massachusetts Legislature passed the *2021 Climate Act* (c. 8 of the Acts of 2021). This legislation further commits and moves Massachusetts forward to a clean energy future. The *2021 Climate Act* builds on *The Global Warming Solutions Act of 2008* and sets an ultimate emissions goal of "at least net zero statewide greenhouse gas emissions" by 2050. The act directs the Secretary of the EEA, in consultation with the DOER, to set GHG emissions limits for 2025, 2030, 2035, 2040, 2045 and 2050. The act also increases the offshore wind procurement authorization to a total of 5,600 MW, to be procured no later than June 30, 2027.[9] Per the *2021 Climate Act*, EEA and DOER must adopt these emissions limits no later than July 1, 2022.[10]

The Project is consistent with and directly advances the Commonwealth's policies for developing offshore wind energy resources.[11] The Project satisfies the legislative directives of the *2021 Climate Act* by enabling the delivery of approximately 1,200 MW of clean renewable energy from the Clean Energy Resource into the Commonwealth and the regional transmission system, and thereby advances the policies set forth in the *2021 Climate Act*.

6.3.3 State and Local Environmental Polices

The Project will contribute to a reliable, diverse, and decarbonized energy supply for the Commonwealth and region with minimal environmental impact. The Project will obtain all environmental approvals, licenses, and permits required by federal, state, and local agencies and will be constructed and operated in compliance with applicable federal, state, and local environmental policies. In addition to the Energy Facility Siting Board's review, the Project will undergo a MEPA review and a federal consistency review by the Massachusetts Office of CZM. Following completion of the MEPA review process, the Project will secure state and local permits, reviews and approvals as set forth in Table 6-11 below.

Table 6-1 identifies the anticipated principal environmental reviews, permits, and approvals required for the Project. The Project will demonstrate compliance with applicable federal, state, and local environmental policies by meeting the requirements for each of these review programs, permits, and approvals.

[9] When submitting amendments on the bill before signing it into law, Governor Baker stated in a letter to the legislature, "significant amounts of offshore wind, as much as 15 GW, will be necessary to reach the Commonwealth's net zero limit. We recognize that more work is needed to ramp up offshore wind development in Massachusetts and to provide clean, affordable power to residents." Letter from Massachusetts Governor Charles D. Baker to the Senate and House of Representatives. February 7, 2021. Available at https://d279m997dpfwgl.cloudfront.net/wp/2021/02/S9-Time-Stamped-Amendment-Letter.pdf.

[10] EEA and DOER are in the process of holding public engagement meetings to discuss the emissions reduction targets. *See* https://www.mass.gov/info-details/massachusetts-clean-energy-and-climate-plan-for-2025-and-2030.

[11] As of May 24, 2022, there is a bill pending in the Massachusetts legislature H.4524, *An Act Advancing Offshore Wind and Clean Energy* that, if enacted, would further strengthen the Commonwealth's commitment to offshore wind.

TABLE 6-1. ENVIRONMENTAL PERMITS, REVIEWS, AND APPROVALS FOR THE MAYFLOWER WIND PROJECT

Agency/Regulatory Authority	Permit/Approval	Status
Federal		
Bureau of Ocean Energy Management (BOEM)[12]	Site Assessment Plan	Approved by BOEM May 26, 2020.
BOEM	Certified Verification Agent Nomination	Approved by BOEM November 4, 2020.
BOEM	Construction and Operations Plan (COP) approval/Record of Decision	Filed February 15, 2021. BOEM published a Notice of Intent to Prepare an Environmental Impact Statement (EIS) for the review of the COP on November 1, 2021. Draft EIS projected for January 2023.
BOEM	Departure request for the early fabrication of Mayflower Wind's Offshore Substation Platform(s) (OSP) and inter-array cables.	Approved by BOEM December 1, 2020.
BOEM	Departure request for deferral of Lease Area geotechnical data.	Approved by BOEM October 5, 2021.
BOEM	National Environmental Policy Act Review	Initiated by BOEM on November 1, 2021.
BOEM	Facilities Design Report and Fabrication & Installation Report	Filing planned for Q1 2024.
U.S. Department of Defense Clearing House	Informal Project Notification Form	Submitted May 11, 2020.
U.S. Army Corps of Engineers (USACE)	Individual Clean Water Act Section 404 Permit. Rivers and Harbors Act of 1899 Section 10 Permit.	Filing planned for Q4 2022.
U.S. Coast Guard (USCG)	Private Aids to Navigation Authorization	To be filed 3-6 months prior to offshore construction.
USCG	Local Notice to Mariners	To be filed prior to offshore construction.
U.S. Environmental Protection Agency (USEPA)	National Pollutant Discharge Elimination System General Permit for Construction Activities	Filing planned for Q3 2022.
USEPA	Outer Continental Shelf (OCS) Permit Clean Air Act	Filing planned for Q4 2022.

[12] In its review of the COP, BOEM must comply with its obligations under the NEPA, the National Historic Preservation Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Migratory Bird Treaty Act, the Clean Air Act, and the ESA. Thus, BOEM coordinates and consults with numerous other federal agencies including the National Marine Fisheries Service, United States Fish and Wildlife Service, the Environmental Protection Agency, and the United States Coast Guard during the review process. BOEM also coordinates with the states under the Coastal Zone Management Act to ensure that the project is consistent with the state's coastal zone management program.

Agency/Regulatory Authority	Permit/Approval	Status
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA) Section 7 consultation Bald and Golden Eagle Act Migratory Bird Treaty Act compliance.	No take authorization is expected to be requested and coordination with USFWS has been initiated and will continue. Basic site evaluation and characterization studies completed and detailed studies ongoing.
National Oceanic and Atmospheric Administration (NOAA) **U.S. National Marine Fisheries Service (NMFS)**	Marine Mammal Protection Act 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 G&G surveys issued on July 23, 2020. IHA for 2021 G&G surveys issued on July 1, 2021. LOA Application for offshore construction and operation submitted March 18, 2022.
Federal Aviation Administration (FAA)	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 station due to the maximum height of these structures. Mayflower 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 installation of the export cables.
State/Massachusetts		
Massachusetts Executive Office of Energy and Environmental Affairs	Massachusetts Environmental Policy Act (MEPA) Environmental Notification Form (ENF) and Environmental Impact Report (EIR) Certificate of Secretary of Energy and Environmental Affairs.	ENF filing planned for Q3 2022. Brayton Point Draft EIR in Q4 2022, and Final EIR in Q2 2023.
Massachusetts Energy Facilities Siting Board (MA EFSB)	Approval to construct the proposed Project, pursuant to G.L. c. 164, § 69J (Siting Petition).	Petition, dated May 27, 2022, accompanies this Analysis.

Agency/Regulatory Authority	Permit/Approval	Status
	Certificate of Environmental and Public Need (Section 72 Approval Consolidated with MA EFSB).	
Massachusetts Department of Public Utilities (MA DPU)	Approval to construct and use proposed Project pursuant to G.L. c. 164, § 72 (Section 72 Petition) Individual and comprehensive exemptions from the zoning bylaws of Somerset for the proposed Project pursuant to G.L. c. 40A § 3 (Zoning Petition).	Filed concurrently with the MA EFSB Petition and Analysis.
Massachusetts Department of Environmental Protection (DEP)	Chapter 91 Waterways License/Permit for dredge, fill, or structures in waterways or tidelands. Section 401 Water Quality Certification.	Joint application filing planned for Q2 2023.
Massachusetts Office of Coastal Zone Management (MA CZM)	CZM Consistency Determination	Filed with COP on February 15, 2021. Revised version filed January 13, 2022. Executed one-year stay with MA CZM beginning on December 30, 2021, with CZM's review re-starting on December 30, 2022, and anticipated completion by May 31, 2023.
Massachusetts Department of Transportation (MassDOT)	State Highway Access Permit(s) (if needed)	Filing planned for Q3 2023.
Massachusetts Board of Underwater Archaeological Resources (BUAR)	Special Use Permit (SUP)	Provisional SUP issued on June 25, 2021. Filed Massachusetts Board of Underwater Archaeological Resources SUP application on August 26, 2021. SUP approved on September 30, 2021. Renewal in Q3 2022.
Massachusetts Historical Commission (MHC)	Project Notification Form/Field Investigation Permits (980 CMR § 70.00). Section 106 Consultation.	Project Notification Form submitted July 26, 2021. Terrestrial Archaeological Resources Assessment (Brayton Point Phase 1A Report) filed on March 15, 2022.
Massachusetts Fisheries and Wildlife (MassWildlife) - Natural Heritage and Endangered Species Program (NHESP)	Endangered Species Act Checklist Conservation and Management Permit (if needed) or No-Take Determination.	Submitted Information Request for state-listed rare species on June 17, 2021.Massachusetts' NHESP issued letter identifying state-listed protected species in proposed Brayton Point Project Area on July 23, 2021. Request for updated list filed with NHESP on March 31, 2022 and received

Agency/Regulatory Authority	Permit/Approval	Status
		on April 28, 2022. Endangered Species Act Checklist filing planned for Q3 2022 (upon Final Environmental Impact Report certificate).
Massachusetts Division of Marine Fisheries (DMF)	Letter of Authorization and/or Scientific Permit (for surveys and pre-lay grapnel run).	To be determined based on consultations with DMF.
Local (for portions of the Mayflower Wind Project within local jurisdiction)		
Somerset Planning & Zoning Board	Local Planning/Zoning Approval(s) (if needed)	Filing of application(s) planned for Q2 2023. Request for individual and comprehensive zoning exemptions filed [pursuant to G.L. c. 40A § 3 filed concurrently with the MA EFSB Petition and Analysis.
Somerset Conservation Commission	Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws).	Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA).
Somerset Department of Public Works, Board of Selectmen, and/or Town Council	Street Operating Permits/Grants of Location.	Filing of application(s) planned for Q2 2023 (if applicable).
Swansea Conservation Commission	Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws).	Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA), if applicable.
State/Rhode Island		
Rhode Island Coastal Resources Management Council (RI 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. Category B Assent and Submerged Lands License pursuant to RIGL § 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2. Letters of Authorization/Survey Permit, if needed, in accordance with the RIGL § 46-23 and 650-RICR-20-00-1.	Filed in Q3 2021. Revised version filed March 16, 2022. Filing planned for Q3 2022. Approved July 7, 2021 for Summary 2021 benthic surveys. Approved February 4, 2022 for Spring 2022 benthic surveys.

Agency/Regulatory Authority	Permit/Approval	Status
	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).	Filing planned for Q3 2022.
Rhode Island Energy Facility Siting Board (RI EFSB) and Rhode Island Public Utilities Commission (PUC)	Certificate of necessity/public utility.	To be filed on May 31, 2022.
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).	Approved on July 2, 2021. Terrestrial Archaeological Resources Assessment (Phase 1A/1B Report) filed March 14, 2022.
Rhode Island Department of Environmental Management (RIDEM)	Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife. 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 (RIGL §§ 46-6.1 et seq.) and Rhode Island Water Quality Regulations (RIGL §§ 46.12 et seq.); (Dredging permit is issued jointly by RIDEM and RI CRMC under RIDEM dredging regulations). Rhode Island Pollution Discharge Elimination System General Permit for Stormwater Discharge Associated with Construction Activity pursuant to RIGL § 42-12 as amended.	Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022. Filing planned for Q3 2022. Filing planned for Q3 2022.
RIDEM Division of Fish & Wildlife (RI DFW)	Letter of Authorization and/or Scientific Collector's Permit (for	TBD based on consultations with RIDEM Division of Fish & Wildlife.

Agency/Regulatory Authority	Permit/Approval	Status
	surveys and pre-lay grapnel run), if needed.	
Rhode Island Department of Transportation (RIDOT)	Utility Permit/Physical Alteration Permit pursuant to RIGL Chapter 24-8.	Filing planned for Q4 2023 (if applicable).

6.3.4 Global Warming Solutions Act

The GWSA, enacted in 2008, established aggressive GHG emissions reduction targets, mandating that the Commonwealth reduce its GHG emissions by 10 to 25 percent from 1990 levels by 2020 and by at least 80 percent from 1990 levels by 2050. In evaluating and issuing permits, the Siting Board and other administrative agencies are obligated by the GWSA to consider reasonably foreseeable climate change impacts (e.g., additional GHG emissions) and related effects (e.g., sea level rise). Additionally, pursuant to the GWSA, the Secretary of the EEA issued the Clean Energy & Climate Plan for 2020 in December 2010, and an update to that plan in December 2015. The Secretary of the EEA is currently drafting a Clean Energy & Climate Plan for 2030, the interim plan was released in December 2020.[13] The interim plan builds upon Governor Baker's 2020 commitment to achieve "net-zero" emissions in Massachusetts by 2050, described in Section 6.3.10. As a step on the pathway to "net-zero," the interim plan requires the state to reduce its annual gross emissions to 14.2 million metric tons of CO_2 equivalent or less by 2050, while ensuring that an equal amount of CO_2 is removed from the atmosphere each year by natural or working lands, or other forms of carbon capture and energy storage accredited to the Commonwealth.[14] The interim plan, as well as the Letter of Determination from the Secretary of the EEA, sets a new goal of achieving 45 percent below the 1990 baseline level by 2030.[15] The interim plan also established four pillars of decarbonization to achieve "net-zero" by 2050, one of which is decarbonizing the energy supply.[16] As a part of this effort, the interim plan notes that "offshore wind is anticipated to be the primary source of electricity for a decarbonized energy system."[17] The Project will contribute to this goal by delivering energy from approximately 1,200 MW of the capacity of the Clean Energy Resource to Massachusetts and the regional grid. The Project and the associated Clean Energy Resource will be among the largest energy resource contributors towards the Commonwealth's net-zero emissions goal.

The Project is consistent with the goals of the GWSA because it will enable the delivery of clean renewable energy from the Clean Energy Resource to the regional electric grid, thereby providing substantial amounts of GHG emissions reductions and an increase of renewable clean energy to the region. The Project and its associated Clean Energy Resource will eliminate more than two million metric tons of GHGs annually, which is equivalent to removing five million cars from the road. When operational, the Project will have no effects on climate change or negative impacts on sea level. Thus, the Project is fully consistent with the goals of the GWSA.

[13] EEA. 2020. Request for Comment on Clean Energy and Climate Plan for 2030. December 30, 2020. Available at https://www.mass.gov/doc/interim-clean-energy-and-climate-plan-for-2030-december-30-2020/download (EEA Interim Plan).
[14] *See infra* Section 6.4.8. "Net-zero" was defined by the EEA as "a level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level." EEA Interim Plan at 2.
[15] EEA Interim Plan at 11; *see also* Massachusetts Executive Office of Energy and Environmental Affairs, Letter of Determination of Statewide Emissions Limit for 2030. Available at https://www.mass.gov/doc/2030-ghg-emissions-limit-letter-of-determination/download.
[16] EEA Interim Plan at 5.
[17] EEA Interim Plan at 36.

6.3.5 The Restructuring Act

As discussed in greater detail in Sections 2 through 5, the Project is consistent with the environmental policies of *The Restructuring Act* (c. 164 of the Acts of 1997), which provides that the Proponent must demonstrate that the Project minimizes environmental impacts and minimizes costs associated with mitigation, control, and reduction of the environmental impacts of the Project. An assessment of all effects of a proposed facility is necessary to determine whether an appropriate balance is achieved both among potentially competing environmental impacts and benefits, as well as among environmental impacts, cost, and reliability. A facility that achieves the appropriate balance thereby meets *The Restructuring Act's* requirement to minimize environmental impacts at the lowest possible cost.

Sections 3 through 5 of this Analysis demonstrate that Mayflower Wind designed the Project based on a thorough analysis of a range of alternatives and has proposed specific plans to mitigate costs and potential environmental impacts of construction, operation, and maintenance of the proposed Project. As such, the Project is consistent with the environmental policies of the Commonwealth as set forth in *The Restructuring Act.*

6.3.6 Environmental Justice Policy

The Project is and will be consistent with Massachusetts' Environmental Justice (EJ) Policy, the EJ provisions of the *2021 Climate Act* and the EJ Protocols put forth by the MEPA Office.[18] Mayflower Wind has made and continues to make diligent efforts to include the community in inclusive outreach efforts in a manner that is consistent with the environmental justice principles of the *2021 Climate Act* and the MEPA Public Involvement Protocol for EJ Populations.[19]

The Commonwealth's EJ Policy was originally published in 2002 by the predecessor to the current EEA. The EJ Policy was updated in 2014 by means of Executive Order, in 2017 by the EEA and again, most recently, in 2021 by the EEA.[20] The 2021 EJ Policy takes into account new directives and definitions from the *2021 Climate Act*, such as a new definition of "environmental justice population"[21] and increased

[18] In compliance with the *2021 Climate Act*, the MEPA Office released the final version of its new regulations and two final protocols regarding new MEPA review procedures to evaluate project impacts on EJ populations. The regulations took effect on December 24, 2021, and the two protocols took effect on January 1, 2022. The MEPA EJ Public Involvement Protocol expands on, but does not supersede, the requirements of the EJ Policy issued by EEA in June 2021. An EJ Screening Form, which must be used to provide applicable EJ populations advance notice of the filing of an ENF is appended to this protocol. The Impacts Analysis Protocol provides guidance for analysis of project impacts, including disproportionate adverse effects and potential climate change impacts, on EJ populations. *See* Massachusetts Environmental Policy Act Office, MEPA Public Involvement Protocol for Environmental Justice Populations (effective January 1, 2022) https://www.mass.gov/doc/final-mepa-public-involvement-protocol-for-environmental-justice-populations-effective-date-of-january-1-2022/download; Massachusetts Environmental Policy Act Office, MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations (effective January 1, 2022) https://www.mass.gov/doc/final-mepa-interim-protocol-for-analysis-of-project-impacts-on-environmental-justice-populations-effective-date-of-january-1-2022/download.

[19] Massachusetts Environmental Policy Act Office, Public Involvement Protocol for Environmental Justice Populations (effective January 1, 2022) https://www.mass.gov/doc/final-mepa-public-involvement-protocol-for-environmental-justice-populations-effective-date-of-january-1-2022/download.

[20] EEA. 2021. Environmental Justice (EJ) Policy. June 24, 2021. Available at https://www.mass.gov/service-details/environmental-justice-policy.

[21] The new definition of Environmental Justice Population: "a neighborhood that meets one or more of the following criteria: (i) the annual median household income is not more than 65 percent of the statewide annual median household income; (ii) minorities comprise 40 percent or more of the population; (iii) 25 percent or more of households lack English language proficiency; or (iv) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income; provided, however, that for a neighborhood that does not meet said criteria, but a geographic portion of that neighborhood meets at least one criterion, the secretary may designate that geographic portion as an environmental justice population upon the petition of at least 10 residents of the geographic portion of that neighborhood meeting any such criteria; provided further, that the secretary may determine that a neighborhood, including any geographic portion thereof, shall not be designated an environmental justice population upon finding that: (A) the annual median household income of that neighborhood is greater than 125 percent of the statewide median household income; (B) a majority of persons age 25 and older in that neighborhood have a college education; (C) the neighborhood does not bear an unfair burden of environmental pollution; and (D) the neighborhood has more than limited access to natural resources, including open spaces and water resources, playgrounds and other constructed outdoor recreational facilities and venues."

protections for EJ populations under the MEPA Environmental Impact Report (EIR) process, discussed later in this section.

The EJ Policy, updated in June 2021, directs governmental resources towards those high minority/low-income neighborhoods in Massachusetts where individuals are most at risk of being unaware or unable to participate in environmental, energy, or climate change decision-making. The EJ Policy directs EEA to engage with these populations in order to restore degraded natural resources, increase access to open space and parks, address environmental and health risks associated with existing and potential new sources of pollution, appropriately address climate change, and to improve overall quality of life. Thus, the EJ Policy requires specific enhanced public participation (under EJ Policy Requirement #16) and analysis (under EJ Policy Requirement #17) for certain projects that are proposed near EJ populations,[22] including certain projects under the jurisdiction of the Siting Board.

A project that meets the following criteria is required to apply the enhanced public participation under the EEA EJ Policy:

1. The project exceeds an ENF threshold for air, solid and hazardous waste (other than remediation projects), or wastewater and sewage sludge treatment and disposal; and
2. The project site is located within one mile of an EJ population (or in the case of projects exceeding an ENF threshold for air, within five miles of an EJ population).[23]

A project that meets the following criteria is required to apply enhanced analysis of impacts and mitigation under the EEA EJ Policy:

1. The project exceeds a mandatory EIR threshold for air, solid and hazardous waste (other than remediation project), or wastewater and sewage sludge treatment and disposal; and
2. The project site is located within one mile of an EJ population (or in the case of projects exceeding a mandatory EIR threshold for air, within five miles of an EJ population). The project proponent may submit actual air modeling data on the project's area of potential air impacts in its EIR scope to modify the presumed five-mile impact area referred to in this condition.[24]

The EJ Policy also lists specific criteria for enhanced public participation and enhanced analysis of impacts and mitigation in Siting Board proceedings under requirement #20. The provisions of #20 require the Siting Board to apply enhanced public participation measures (if required by #16) such as translating hearings and notices into languages relevant to EJ populations in accordance with the Commonwealth's Language Access Policy. Additionally, #20 requires the Siting Board to apply enhanced analysis of impacts and mitigation (if required by #17) for projects within Siting Board jurisdiction. Requirement #20 states, "decisions issued by the Siting Board include measures to mitigate such

[22] The 2021 Climate Act provides the following definition: "Environmental justice population," a neighborhood that meets one or more of the following criteria: (i) the annual median household income is not more than 65 per cent of the statewide annual median household income; (ii) minorities comprise 40 percent or more of the population; (iii) 25 percent or more of households lack English language proficiency; or (iv) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income; provided, however, that for a neighborhood that does not meet said criteria, but a geographic portion of that neighborhood meets at least one criterion, the secretary may designate that geographic portion as an environmental justice population upon the petition of at least 10 residents of the geographic portion of that neighborhood meeting any such criteria; provided further, that the secretary may determine that a neighborhood, including any geographic portion thereof, shall not be designated an environmental justice population upon finding that: (A) the annual median household income of that neighborhood is greater than 125 percent of the statewide median household income; (B) a majority of persons age 25 and older in that neighborhood have a college education; (C) the neighborhood does not bear an unfair burden of environmental pollution; and (D) the neighborhood has more than limited access to natural resources, including open spaces and water resources, playgrounds and other constructed outdoor recreational facilities and venues.

[23] EJ Policy #16 at pg. 11.

[24] EJ Policy #17 at pg. 11.

impacts for the affected communities, with enhanced review required where EJ populations are present."

The requirements for enhanced public participation and enhanced analysis of impacts and mitigation under the EJ Policy do not apply to the Project because the Project does not exceed any ENF or EIR thresholds for air, solid and hazardous waste, or wastewater and sewage sludge treatment and disposal.

As of the time of the filing of this Petition with the Siting Board, Mayflower Wind completed the EJ Screening Form for the Project. Mayflower Wind expects to provide notice and file the Project ENF in accordance with the new MEPA EJ Protocols in the near future. Notice of the Project will be translated to Spanish, Portuguese, and Portuguese Creole, as identified using the MEPA EJ Tools.

Although the Siting Board is not required by the EJ Policy to analyze the Project under the enhanced standards of the EJ Policy Requirements #16 or #17, Mayflower Wind will work with the Siting Board to develop appropriately accessible notices for the Project consistent with Siting Board precedent and guidance.

The *2021 Climate Act* amended the EIR process in Massachusetts by directing that an EIR shall be required for any project that is likely to cause damage to the environment and is located within a distance of one mile of an environmental justice population.[25] The *2021 Climate Act* requires that the EIR contain statements about the results of an assessment of any existing unfair or inequitable environmental burden and related public health consequences impacting the EJ population from any prior or current project that has damaged the environment. If the assessment indicates that the EJ population is subject to an existing unfair or inequitable environmental burden or related health consequence, the report must identify any: (1) environmental and public health impact from the proposed project that would likely result in a disproportionate effect on such population; and (2) potential impact or consequence from the proposed project that would increase or reduce the effects of climate change on the environmental justice population.[26] The *2021 Climate Act* requires that for every project that is required to file an ENF, the proponent of the project shall indicate on the document whether an environmental justice population that lacks English language proficiency within a designated geographical area is likely to be negatively affected by the project.

Further, the *2021 Climate Act* identifies environmental justice principles, and directs that Massachusetts agencies should consider these principles in their policy-making decisions. The environmental justice principles are those that support protection from environmental pollution and the ability to live in and enjoy a clean and healthy environment, regardless of race, color, income, class, handicap, gender identity, sexual orientation, national origin, ethnicity or ancestry, religious belief or English language proficiency, including: (i) the meaningful involvement of all people with respect to the development, implementation and enforcement of environmental laws, regulations and policies, including climate change policies; and (ii) the equitable distribution of energy and environmental benefits and environmental burdens.

Finally, the *2021 Climate Act* puts forth additional public participation requirements for those projects that may impact an EJ population. As mentioned above, in response, in 2021, the MEPA Office issued the MEPA EJ Public Involvement Protocol. This EJ Protocol requires that all new ENFs submitted identify

[25] For projects that impact air quality, this EIR is required if the project is likely to cause damage to the environment and is located within a distance of 5 miles of an environmental justice population.

[26] The 2021 Climate Act also requires that an EIR contain: (i) statements describing the nature and extent of the proposed project and its environmental and public health impact as a result of any development, alteration and operation of the project; (ii) studies to evaluate said impacts: (iii) all measures being used to minimize any anticipated environment and public health damage; (iv) any adverse short term and long-term environmental and public health consequences that cannot be avoided should the project be undertaken; and (v) reasonable alternatives to the proposed project and their environmental consequences.

the location of the project relative to EJ Populations as identified on its official EJ Mapping Tool and provide a print-out to identify all EJ populations within a 1.0-mile and 5.0-mile radius of the project.[27] The EJ Public Involvement Protocol also requires that the ENF indicate whether the project is "reasonably likely" to negatively affect EJ populations within a 1.0-mile radius of the project.[28] For enhanced public participation, the *2021 Climate Act* and EJ Public Involvement Protocol require that projects that affect an EJ population within a 1.0-mile or 5.0-mile radius of the project comply with additional public outreach and communication efforts such as providing advance notification of the project to community-based organizations and promoting public involvement through meaningful outreach and engagement. Mayflower Wind has used diligent efforts to involve the impacted communities and will continue to engage in open communication with the local communities in close proximity to the Project. Mayflower Wind used the EJ Mapping Tool to identify the languages required and has thus far provided and will continue to provide language translation tool on its website and language translation and interpretation services if requested to those populations. Mayflower Wind also has promoted meaningful public involvement and maintains a distribution list of community-based organizations and individuals who have requested to receive ongoing Project updates. Finally, Mayflower Wind has an accessible website available in twelve different languages that contains information about the Project and has held and will continue to organize continue to community meetings about the Project to present information and answer questions. Finally, Mayflower Wind will provide advanced notification through the EJ Screening Form to community-based organizations.

Mayflower Wind's environmental analysis is intended to achieve the goals of the EJ Policy and the environmental justice principles of the *2021 Climate Act* by minimizing environmental impacts and risks for all populations. Mayflower Wind has undertaken diligent efforts to identify EJ populations near the Project (see Figure 5-9) and will continue extensive community outreach efforts intended to include EJ populations in decision-making and facilitate open and informed communication and participation for all potentially impacted populations.

The Project is and will be consistent with the EJ Policy, the 2021 Climate Act, and the MEPA EJ Protocols. Mayflower Wind has worked to reduce the impacts of the Project for all populations, including EJ populations. Mayflower Wind will also meet the public participation requirements through extensive community outreach to the populations in the vicinity of the Project. Although the direct requirements of enhanced public participation or enhanced analysis under the EJ Policy do not apply to the Project because the Project does not exceed any ENF or EIR thresholds for air, solid and hazardous waste, or wastewater and sewage sludge treatment and disposal, Mayflower Wind nonetheless has made and continues to make a diligent effort to include the community in inclusive outreach efforts. Additionally, likely impacts from the construction of the Project will be carefully mitigated and long-term impacts of the Project will be minimized, as described in Section 5.4. Mayflower Wind will comply with the translation and interpretation requirements of the MEPA EJ Protocols and will make materials available in the identified languages spoken by more than five percent of the population in the area around the Project, which includes Spanish, Portuguese, and Portuguese Creole.

Finally, one of the main goals of the EJ Policy is to promote climate change resiliency and mitigate the potential effects of climate change. The Project is entirely consistent with and advances this goal, as it will deliver approximately 1,200 MW of clean renewable energy to the Commonwealth and help achieve the goals of the GWSA.

[27] The Commonwealth's EJ Mapping Tool can be found at: https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212.

[28] In making the determination about the environmental impacts, project proponents are directed to use analysis required in 301 CMR 11.07(6)(n) and the *MEPA Interim Protocol for Analysis of EJ Impacts* as a frame of reference.

6.3.7 Massachusetts Ocean Management Plan

The Massachusetts OMP, initially released in 2009 and revised in 2015 and 2021, creates a framework for managing uses and activities within the state's ocean waters. The OMP's geographic scope includes the ocean waters, seafloor, and subsurface and its jurisdiction covers the area from the seaward limit of State waters (generally 3.0 mi [5.0 km] offshore) to a nearshore boundary that lies approximately 0.3 mi (0.5 km) seaward from Mean High Water. As stipulated in *The Oceans Act of 2008* (c. 114 of the Acts of 2008), and described in Chapter 1 of the OMP, implementation is achieved through existing state review procedures, whereby all licenses, permits and leases are required to be consistent to the maximum extent practicable with the OMP. Since the OMP is incorporated into the Massachusetts CZM Plan, all federal actions must also be consistent with the OMP. Any project that requires an EIR pursuant to MEPA is subject to the OMP and OMP siting and performance standards. The OMP's mapped resources guide the scope of relevant aspects of the MEPA review. As directed by the Oceans Act, the ocean plan identifies and establishes siting and performance standards to protect delineated SSU resources and areas of concentrations of water-dependent uses (WDU).

The Lease Area is located outside of the Commonwealth's waters and, therefore, does not fall within the scope of the OMP. The ECC is located within the Commonwealth's waters but outside of the Ocean Management Planning Area and, therefore, does not fall within any Prohibited Areas (i.e., Cape Cod Ocean Sanctuary) (Figure 1-8). The Project will comply with all siting and performance and management standards applicable to cable projects.

The OMP addresses cables and pipelines through siting and performance standards. For both cables and pipelines, the intent of the OMP is to minimize the cumulative impact of future development by requiring that linear infrastructure be co-located within common or adjacent corridors to the maximum extent practicable, with allowances for sufficient space between projects for necessary operations and maintenance, generally according to industry standards. The Project's offshore ECC options associated with the Preferred Route and Noticed Alternative Route do not currently offer the opportunity for significant co-location with other existing or planned linear infrastructure. In case other planned linear infrastructure is developed where there may be a co-location opportunity, the Project will consider such opportunities if they arise.

Surveys to confirm the predominance of soft-bottom seafloor (i.e., the general absence of hard-bottom substrate) such that sufficient burial depths for cables can be reasonably expected are also required. Hard seafloor is seabed characterized by exposed bedrock or concentrations of boulder, cobble, or other similar hard bottom distinguished from surrounding unconsolidated sediments. Geophysical surveys were conducted in 2020 and 2021 to determine seabed conditions along the ECC. Figure 6-1 shows the sediment trends within the ECC, confirming the predominance of soft-bottom seafloor. The surficial sediments along the ECC includes primarily sand, mud to muddy sand, gravel, muddy sediments, shell, gravelly mud, and assorted anthropogenic substrate near the shoreline. Only small areas of hard-bottom substrate, such that the cable route cannot be practicably located without going through these areas of hard-bottom substrate, will be traversed within acceptable limits.

6.3.7.1 Management Standards for Special, Sensitive, or Unique Habitats and Water-dependent Uses

Relevant OMP regulations, found at 301 Code of Massachusetts Regulations (CMR) 28.00, provide management standards for SSU resources and WDUs. Cable projects (including those associated with offshore wind renewable energy projects) are only required to address their compliance with the performance standards for the following SSUs: (1) core habitat of the North Atlantic right whale, fin, and humpback whales; (2) hard/complex seafloor; (3) eelgrass; and (4) intertidal flats, and the following

WDU: (1) fixed fishing facilities. The OMP contains mapping that delineates these SSUs and WDU. Figure 1-8 shows the OMP mapping of any SSUs or WDU located in the general Project area. The Project is not located in or adjacent to the following SSUs or WDU:

- Fin whale Core Habitat
- Humpback whale Core Habitat
- Hard/complex seafloor
- Eelgrass
- Intertidal flats
- Fixed fishing facilities

However, the Brayton Point ECC does pass through the remaining SSU, North Atlantic right whale core habitat in federal waters.[29] The relationship of the Project to this SSU is described below.

North Atlantic Right Whale Core Habitat

The North Atlantic right whale (*Eubalaena glacialis*) is both a state and federally listed endangered species that regularly uses Massachusetts waters for feeding. The OMP established the North Atlantic right whale core habitat SSU resource based on data that identified statistically significant use by right whales of certain areas of the Massachusetts coast.[30] The ECC travels through North Atlantic right whale core habitat within federal waters. Mayflower Wind has developed a Marine Mammal and Sea Turtle Monitoring and Mitigation Plan that outlines specific measures that will be undertaken to protect North Atlantic right whales, including visual and acoustic monitoring, clearance zones, and use of additional advanced technologies during periods of night work or other low visibility conditions.

6.3.7.2 Conformance with the OMP

The Project is consistent with the OMP because:

- The Project is consistent with the siting and performance standards for cables, as the proposed ECC will avoid impacts to North Atlantic right whale core habitat.
- The proposed ECC minimizes environmental impacts for the Project, as described in Sections 4.6 and 5.5.
- All practicable measures to avoid damage to SSU resources and WDUs and to mitigate impacts to those resources will be taken. The proposed ECC options avoid to the maximum extent practicable areas of hard/complex bottom, only passing through these areas where there is no less damaging practicable alternative (see Section 4.6 for a discussion of the routing considerations), and where passage through hard/complex bottom is necessary, all practicable measures to avoid damage to SSU resources and mitigate impacts to those resources will be taken (see Sections 4 and 5).
- The public benefits analysis described in the context of the public benefit determination demonstrates that the Project's public benefits outweigh any detriments to the SSU resources (see Section 1).

[29] Mayflower Wind is addressing OMP resources located in federal waters as part of the Project's review with the Massachusetts Office of Coastal Zone Management, as described in the Mayflower Wind Massachusetts Coastal Zone Management Act Consistency Statement filed on January 13, 2022. .

[30] Massachusetts Geographic Information System (MassGIS). 2022. "North Atlantic Right Whale Core Habitat Feature Layer." North Atlantic Right Whale Core Habitat - Overview (arcgis.com). Accessed March 25, 2022.

6.3.8 Filled Tidelands Legislation/Public Benefit Determination

In 2007, the Massachusetts Legislature passed *An Act Relative to the Licensing Requirements for Certain Tidelands* (c. 168 of the Acts of 2007). The Act names the Secretary of the EEA as the "administrator of tidelands," and requires the Secretary to conduct a "public benefit review" and issue a written determination for projects based on the tidelands. Pursuant to the corresponding regulations, 301 CMR 13.02(1), the Secretary is required to conduct a public benefit determination for any project that: (a) files an ENF after November 15, 2007, (b) is required to file an EIR, and (c) is completely or partially located in tidelands or landlocked tidelands. Pursuant to 301 CMR 13.02(2), the Secretary may conduct a discretionary public benefit review for any project that (a) files an ENF after November 15, 2007, (b) is not required to file an EIR, and (c) is completely or partially located in tidelands or landlocked tidelands.

The Secretary is guided in this review process by analyzing the "water dependency" of the project. The Mayflower Wind Project is presumptively water-dependent: the Massachusetts regulations at 310 CMR 9.12(2)(e), provide that, "in the case of a facility generating electricity from wind power (wind turbine facility) or any ancillary facility therefore, for which an EIR is submitted, DEP shall presume such facility to be water dependent if the Secretary has determined that such facility requires direct access to or location in tidal waters." The Project is expected to receive such a determination. Under 301 CMR 13.04, "water dependent" projects are presumed to meet the criteria and provide adequate public benefit.[31] This public benefit determination is done in conjunction with Chapter 91 review by the DEP. 301 CMR 13.05 states "The Department shall incorporate the public benefit determination of the secretary in its official record of the Chapter 91 license."

The Chapter 91 areas of geographical jurisdiction over the Mayflower Wind Project include the following:

- Flowed Tidelands - Any project located in, on, over or under tidal waters seaward of the present mean high-water shoreline. Jurisdiction in this case extends seaward three miles, to the state limit of territorial jurisdiction.
- Filled Tidelands - The limit on filled tidelands is: Inside Designated Port Areas, the historic mean high-water shoreline (i.e., all filled areas).

Figure 1-7 depicts the mean high-water mark and locations of historically filled tidelands at Brayton Point. Brayton Point lies within the boundaries of the Mount Hope Bay Designated Port Area. Filled tidelands are former submerged lands and tidal flats which are no longer subject to tidal action due to the presence of fill. Chapter 91 authorization is required for activities on filled tidelands. The offshore export cable installation will be located within jurisdictional flowed tidelands, and minor portions of the HDD landfall operations and construction of the underground duct bank and manhole system will be partially located within areas designated as historically filled tidelands. The installation of these underground facilities at Brayton Point will not impact the public's rights to access, use, and enjoy tidelands that are protected by Chapter 91. Further, the Brayton Point site is a privately-owned Designated Port Area with active energy, industrial and commercial uses, where public access is limited for safety and security purposes.

[31] The criteria for the Secretary to analyze for non-water-dependent projects are: (a) the purpose and effect of the project, (b) the impact on abutters and the surrounding community, (c) enhancement to the property, (d) benefits to the public trust rights in tidelands or other associated rights, including but not limited to, benefits provided through previously obtained municipal permits, (e)community activities on the site, (f) environmental protection and preservation, (g) public health and safety, and the general welfare. 301 CMR 13.04.

6.3.9 Massachusetts Coastal Zone Management Federal Consistency Statement

The Project is consistent with the Massachusetts CZM program. The program requires a certification to the Massachusetts Office of CZM affirming that the Project complies with the enforceable program policies of Massachusetts' approved CZM program and will occur in a manner consistent with these policies. As described in detail in Section 4, a thorough routing analysis was performed to evaluate Project siting and routing options for Brayton Point, which included the consideration of coastal features. The Project area at Brayton Point is shown in Figure 4-3.

The certification to CZM will be made in accordance with the requirements of the Federal *Coastal Zone Management Act*, 16 U.S.C. 1451, *et seq.*, the implementing regulations, 15 C.F.R. 930, as well as Massachusetts regulations at 301 CMR 20.00. The certification will also be made pursuant to the relevant statutory and regulatory authorities of Massachusetts' CZM Plan and Program Policies.[32] The Analysis contained herein describes the Project's compliance with each of the Massachusetts CZM program policies.

6.3.9.1 Jurisdiction for Federal Consistency Certification

The Project requires a federal consistency certification because it requires federal action and may affect, and is located within, the Massachusetts coastal zone. This Project involves the installation of energy facilities on the OCS and therefore meets the definition of a Coastal Energy Activity under the *Coastal Zone Management Act* (16 U.S.C. 1453 (5)(i)). The Project will require separate approval of the COP (Lease Area OCS-A 0521) by the BOEM. The Mayflower Wind Project will then require a permit from the USACE pursuant to Sections 404 and 408 of the Federal *Clean Water Act* and Section 10 of the *Rivers and Harbors Act of 1899*. As described in the CZM Policy Guide,[33] the official Massachusetts coastal zone includes the lands and waters within an area defined by the seaward limit of the state's territorial sea, extending from the Massachusetts-New Hampshire border south to the Massachusetts-Rhode Island border, and landward to 100 ft (30 m) inland of specific major roads, rail lines, and other visible rights-of-way, where present, or in the absence of these, at the coordinates specified by CZM. Project facilities to be located within the coastal zone, and thus within the jurisdiction of the CZM, include the offshore export cables within State waters, associated landfall locations, onshore underground export cables, HVDC converter station, underground transmission cables, and the POI at the National Grid substation (Figure 1-5). In November 2021, Mayflower Wind agreed to voluntarily provide its Massachusetts consistency certification submission package containing the necessary data and information for both the Project and the Clean Energy Resource to CZM. In December 2021, Mayflower Wind and CZM agreed to a 12-month stay of CZM's federal consistency review; the consistency review is scheduled to begin in December 2022.

6.3.9.2 Certification of Consistency with CZM Program Policies

The following section describes the Project's compliance with the CZM program enforceable policies and management principles as set forth in the policy appendix at 301 CMR 21.98. The responses provided herein to the coastal policies were extracted from the Final Massachusetts CZM Act Consistency Certification (January 2022 version) that was filed with Massachusetts CZM. .

[32] Massachusetts Office of Coastal Zone Management, Coastal Zone Management Policies. Available at https://www.mass.gov/files/documents/2021/01/14/czm-policy-guide-policies-with-index.pdf.
[33] Massachusetts Office of Coastal Zone Management, Coastal Zone Management Policies, at 3. 2011. Available at https://www.mass.gov/files/documents/2021/01/14/czm-policy-guide-policies-with-index.pdf.

Coastal Hazards

Coastal Hazards Policy #1

Preserve, protect, restore, and enhance the beneficial functions of storm damage prevention and flood control provided by natural coastal landforms, such as dunes, beaches, barrier beaches, coastal banks, land subject to coastal storm flowage, salt marshes, and land under the ocean. (CZM, 2011 pp. 19-25)

This policy protects natural areas of the Massachusetts coastline that serve valuable functions as flood and storm control features. Mayflower Wind will comply with this policy by utilizing construction techniques and placing the export cable landfall in an area where these natural ecosystem functions and landforms will not be altered.

Installation of the export cables will affect Land Under the Ocean as defined in the Massachusetts Wetlands Protection Act (WPA; G.L. c. 131 § 40) and implementing regulations (310 CMR 10.00). The minor changes to the seabed associated with the burial of the cables are not anticipated to significantly affect the storm damage prevention and flood control functions of Land Under the Ocean.

To avoid impacts to nearshore areas and other coastal landforms, Mayflower Wind will use an HDD method for the cable landfall, which is a trenchless installation method that will allow the Project to avoid directly impacting sensitive coastline areas (see MassDEP wetlands in Figure 6-2). The landing location(s) themselves avoid mapped coastal resources. An HDD landfall method will allow for the export cables to make landfall through a horizontal tunnel bored several meters underneath these nearshore areas and coastline features. The horizontal tunnel boring at Brayton Point will be completed by a drill rig set up onshore within previously disturbed land, with the drill exiting on the seafloor approximately 1,640 ft (5,000 m) from shore, where the direct burial of the export cables through state waters would end and the cables would be pulled to shore through the HDD bore holes.

For the preferred Brayton Point ECC, the export cables will make landfall within a developed area on the western shoreline of Brayton Point from the Lee River. This location was chosen for the export cable landfall because it contains a highly developed land area and close proximity to the converter station site and POI at the existing National Grid substation (Figure 4-3). This location will control or eliminate the damage to coastal areas that assist in flood control and storm damage prevention. The Project will use an HDD method for the export cable landfall, which will avoid impacts to coastal landforms, including Coastal Beach, and Coastal Bank, as defined in the Massachusetts WPA (Figure 6-2).

Following completion of onshore construction, restoration of the HDD landfall location and installation of the underground onshore export cables, the Project will have no effect on flood velocities or floodplain storage capacity, and therefore no permanent impacts to Land Subject to Flooding or Land Subject to Coastal Storm Flowage would result as all Project facilities will be below the ground surface and all pre-construction grades and contours will be restored.

Coastal Hazards Policy #2

Ensure that construction in water bodies and contiguous land areas will minimize interference with water circulation and sediment transport. Flood or erosion control projects must demonstrate no significant effects on the project site or adjacent or downcoast areas. (CZM, 2011 pp. 25-26)

The Project, as proposed, will not interfere with water circulation or pose a threat to the integrity of downcoast areas.

Installation of the export cables and the HDD exit pit in state waters is anticipated to temporarily increase turbidity in the localized areas. An assessment has been conducted to evaluate sediment dispersion during installation of the cables and possible dredging of the HDD exit pit within the Brayton

Point ECC. Scour will be evaluated based on data collected during the geophysical and geotechnical surveys, available hydrodynamic modeling results, and published information.

Mayflower Wind will be constructing onshore portions of the Project within previously disturbed or developed areas of Brayton Point (Figure 5-8). Once landfall is made, the underground export cables will traverse the site from the landing to the location of a new HVDC converter station. Underground transmission cables will be constructed from the converter station to the POI, an existing National Grid substation. The HVDC converter station at Brayton Point will conform to the Massachusetts Stormwater Policy and will not alter existing sediment transport or circulation patterns or result in changes in stormwater runoff and flooding.

In regard to the Brayton Point ECC, a hydrodynamic and sediment transport modeling assessment was completed to evaluate sediment dispersion during installation of the cables within the Brayton Point ECC. Scour was evaluated based on data collected during the geophysical and geotechnical surveys, available hydrodynamic modelling results, as well as literature data. The results of the sediment dispersion modeling indicated that the water column concentration of total suspended solids (TSS) and the sediment deposition pattern and thickness were most heavily influenced by the properties of the trench sediments (i.e., grain size distribution) disturbed during the jet trenching operations and localized current velocities. The dimensions of the trench, the advance rate, and the loss rate (a conservative loss rate of 25 percent representative of the jetting or mechanical trenching and 100 percent for the HDD pit dredging) to the water column, specified the total amount of sediments re-suspended, but the response was short lived for all but the finest grade sediments (silts and clays). Despite conservative model assumptions applied during the assessment, water column TSS concentrations and seabed deposition sediment thickness and extent as a result of the cable installation/burial operations and HDD exit pit dredging remain generally localized and of short duration. In all areas excluding Mount Hope Bay and a portion of the offshore export cable in Rhode Island Sound, the TSS concentration fell below the 100 milligrams per liter threshold in less than 20 minutes. The resettlement times for Mount Hope Bay and a portion of Rhode Island Sound were 4.6 hours and 2.9 hours, respectively. These results indicate that the water column TSS concentration impacts from the export cable installation activities were contained to within or near the Brayton Point ECC and were short lived**.**

Coastal Hazards Policy #3

Ensure that state and federally funded public works projects proposed for location within the coastal zone will: (1) not exacerbate existing hazards or damage natural buffers or other natural resources; (2) be reasonably safe from flood and erosion-related damage; (3) not promote growth and development in hazard-prone or buffer areas, especially in velocity zones and Areas of Critical Environmental Concern; and (4) not be used on Coastal Barrier Resource Units for new or substantial reconstruction of structures in a manner inconsistent with the Coastal Barrier Resource/Improvement Acts. (CZM, 2011 pp. 26-28)

Not applicable. There are no state or federally funded public works projects as a result of the proposed action.

Energy

Energy Policy #1

For coastally dependent energy facilities, assess siting in alternative coastal locations. For non-coastally dependent energy facilities, assess siting in areas outside of the coastal zone. Weigh the environmental and safety impacts of locating proposed energy facilities at alternative sites. (CZM, 2011 pp. 19-25)

The Project involves the installation of a commercial-scale array of offshore WTGs within an established federal lease area for wind energy generation, which will produce clean, renewable energy for the New England region, and fulfill the obligations of the 20-year PPAs between Mayflower Wind and the six utilities within the New England area. Mayflower Wind was awarded PPAs, for 804 MW and 400 MW, respectively, in two separate Massachusetts competitive solicitations to procure offshore wind generation.

The Project is inherently coastal-dependent. The federal lease areas were previously the subject of an Alternatives Analysis completed by BOEM during establishment of the MA/RI WEA, in which the Clean Energy Resource is located. This Analysis was conducted as a portion of the Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic OCS Offshore Rhode Island and Massachusetts: Environmental Assessment which received a Finding of No Significant Impact in May 2013. This Environmental Assessment included a prepared Consistency Determination pursuant to 15 C.F.R. 930.36(a) sent to the Commonwealth of Massachusetts on August 20, 2012, for review. The Environmental Assessment provided all data and information required under 30 C.F.R. 939.39 to support the Consistency Determination. BOEM determined that the activities described in the revised Environmental Assessment were consistent with the enforceable policies of the Massachusetts CZM Program. The Commonwealth of Massachusetts concurred with BOEM's determination on January 30, 2013.[34]

To transmit electricity generated from the offshore WTG array to the onshore administered electrical grid, the shortest practicable path to shore will be used while considering engineering feasibility and environmental constraints and regulatory concerns. This path to transmit the generated electricity will naturally cross through the coastal areas of Massachusetts, and Mayflower Wind has assessed multiple alternative routes for the export cables, as well as potential landfall locations. The evaluation of these alternatives is detailed within Sections 3.0 and 4.0.

Mayflower Wind evaluated potential landing locations with a goal of reducing onshore export cable distance from the landfall to the converter station, avoidance of existing infrastructure and water dependent uses. Mayflower Wind assessed land uses adjacent to potential landfall locations to understand environmental impacts, potential for use of existing infrastructure, and areas with historic and conservation districts, businesses or communities that could be impacted. Mayflower Wind also evaluated different potential sites for the converter station and has identified a target area within which the converter station will likely be sited. Mayflower Wind completed these efforts to site the Project in a way that would ensure minimal displacement of water dependent industries and minimize environmental impact to the extent practicable. Therefore, the Project is fully consistent with this CZM policy requiring the assessment of siting Project facilities within alternative coastal locations.

Habitat

Habitat Policy #1

Protect coastal, estuarine, and marine habitats—including salt marshes, shellfish beds, submerged aquatic vegetation, dunes, beaches, barrier beaches, banks, salt ponds, eelgrass beds, tidal flats, rocky shores, bays, sounds, and other ocean habitats—and coastal freshwater streams, ponds, and wetlands to preserve critical wildlife habitat and other important functions and services including nutrient and

[34] U.S. Department of the Interior, Bureau of Ocean Energy Management (BOEM). May 2013. Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Rhode Island and Massachusetts, Revised Environmental Assessment. OCS EIS/EA BOEM 2013-1131.

sediment attenuation, wave and storm damage protection, and landform movement and processes. (CZM, 2011 pp. 41-48)

Mayflower Wind has designed the Project to avoid impacts to ecologically sensitive areas to the maximum extent practicable, including nearshore coastal areas, natural shoreline areas, as well as saltwater and freshwater wetlands that are particularly sensitive to impacts. Figures 6-3 shows the Brayton Point ECC in relation to areas of concern or sensitive ocean habitat for consideration in siting transmission cables as mapped within the Massachusetts OMP. Figure 6-2 shows locations of coastal and marine habitats in the vicinity of the export cable landfall locations under consideration. Selection of the preferred landfall location and use of HDD will avoid impacts to mapped coastal salt marshes, tidal flats, barrier beaches, salt ponds, bays and sounds, coastal beach, dunes, or rocky shores.

The Brayton Point ECC is located within areas designated as Land Under the Ocean by the Massachusetts WPA (G.L. c. 131 § 40). The Brayton Point ECC route may contain shellfish (Figure 1-9); no submerged aquatic vegetation has been mapped in the vicinity of the Brayton Point ECC in Massachusetts waters. Mayflower Wind will use the findings of surveys of the ECC to evaluate technical feasibility and environmental considerations, such as the presence of hard bottom habitat, mapped shellfish suitability areas, and the presence of glacial-derived boulders. The ECC in coastal waters near Brayton Point crosses shellfish suitability areas (Figure 1-9). No areas of mapped hard bottom (an OMP SSU) are mapped within the Brayton Point ECC. However, as illustrated in Figure 6-4, mapped surface sediments identify the presence of gravel and rock substrates in certain areas that may represent hard bottom or complex habitat. Not all sensitive habitat and resource areas can be avoided. Mayflower Wind has selected a preferred cable route to avoid impacts to these areas to the greatest extent practicable. The ECC under consideration is approximately 2,300 ft (700 m) in width to allow maximum flexibility to refine siting to avoid sensitive habitats and resources and may be locally narrower or wider in sensitive or constrained areas.

Benthic sampling was conducted along the Brayton Point ECC in Summer 2021 and Spring 2022 to identify sensitive habitat; this information will support final cable alignment to avoid and/or minimize impacts. In addition to the sediment profile imaging/plan view images and grab cam videos, video transects have been collected along the Brayton Point ECC to the preferred and alternate landings. Sampling results do not identify seagrass in the Brayton Point ECC within Massachusetts waters. The benthic data in combination with the geophysical survey data will also be used to identify the potential hard bottom and/or complex bottom.

Export cable installation will temporarily alter the seabed habitat, resulting in some effects associated with mortality and displacement during construction and some effects associated with recovery time from the areas affected by their placement. Where the bottom substrate is characterized by more heterogeneous, complex habitats, disturbance of the benthic communities is expected to require a longer period (estimated one to three years) to recover.[35] These complex habitats will be avoided wherever possible. Construction-related impacts are expected to be temporary.

The Project will use an HDD method for the export cable landfall which will limit impacts to both nearshore areas as well as coastal landforms, including Coastal Beach, and Coastal Bank (Figure 6-2). No comprehensive eelgrass surveys are currently planned for the Brayton Point landfall sites. Benthic habitat surveys confirmed the absence of eelgrass at Brayton Point landfall sites in Massachusetts waters.

[35] Guarinello, M., D. Carey, and L.B. Read. 2017. Year 1 Report for 2016 Summer Post-Construction Surveys to Characterize Potential Impacts and Response of Hard Bottom Habitats to Anchor Placement at the Block Island Wind Farm (BIWF). INSPIRE Environmental prepared for Deepwater Wind Block Island LLC. May.

Additionally, the onshore export cables will be installed underground from the landfall location to the converter station. From the converter station, underground transmission cables will be installed to connect to the POI, the existing National Grid substation. The Brayton Point site has been previously developed and disturbed, and as such natural habitat and regulated resources are not present on the site within the proposed onshore Project footprint. This will eliminate or limit impacts to onshore coastal habitat areas to the maximum extent practicable.

Habitat Policy #2

Advance the restoration of degraded or former habitats in coastal and marine areas. (CZM, 2011 pp. 48-50)

The Project has been designed to avoid impacts to coastal and marine habitats to the maximum extent practicable, and those impacts that cannot be avoided will be mitigated in accordance with applicable federal, state, and local regulations. Mayflower Wind will comply with performance standards identified in the Massachusetts WPA. In doing so, the Project will serve the protected statutory interests.

See response provided above in Habitat Policy #1.

Ocean Resources

Ocean Resources Policy #1

Support the development of sustainable aquaculture, both for commercial and enhancement (public shellfish stocking) purposes. Ensure that the review process regulating aquaculture facility sites (and access routes to those areas) protects significant ecological resources (salt marshes, dunes, beaches, barrier beaches, and salt ponds) and minimizes effects on the coastal and marine environment and other water-dependent uses. (CZM, 2011 pp. 50-53)

The Project is not an aquaculture development, nor will it affect any current aquaculture facilities or local shell-fishing areas. As detailed in Section 4.6, Commercial and Recreational Fisheries and Fishing Activity, commercial and recreational fishing areas will not be permanently impacted by the Project nor will access to these areas be affected. More specifically, as illustrated in Figure 6-5, there are no aquaculture lease sites in the vicinity of the Brayton Point ECC within the MA Coastal Zone Boundary or in federal waters.

Ocean Resources Policy #2

Except where such activity is prohibited by the Ocean Sanctuaries Act, the Massachusetts Ocean Management Plan, or other applicable provision of law, the extraction of oil, natural gas, or marine minerals (other than sand and gravel) in or affecting the coastal zone must protect marine resources, marine water quality, fisheries, and navigational, recreational and other uses. (CZM, 2011 pp. 53-55)

Not applicable. The Project does not involve extracting oil, natural gas, or marine minerals.

Ocean Resources Policy #3

Accommodate offshore sand and gravel extraction needs in areas and in ways that will not affect marine resources, navigation, or shoreline areas due to the alteration of wave direction and dynamics. Extraction of sand and gravel, when and where permitted, will be primarily for the purpose of beach nourishment or shoreline stabilization. (CZM, 2011 pp. 55-57)

Not applicable. The Project does not include the extraction of sand and gravel from marine areas, and it is not anticipated to affect any ongoing or planned sand and gravel extraction activities.

Ports and Harbors

Ports and Harbors Policy #1

Ensure that dredging and disposal of dredged material minimize effects on water quality, physical processes, marine productivity and public health and take full advantage of opportunities for beneficial re-use. (CZM, 2011 pp. 57-61)

Not applicable. At this time, it is not anticipated that construction of the Mayflower Wind Project would require dredging at any port or harbor facilities. As such, there will be no dredge material produced from port and harbor areas, nor will there be any need to dispose of dredge material originating from such facilities.

Ports and Harbors Policy #2

Obtain the widest possible public benefit from channel dredging and ensure that Designated Port Areas and developed harbors are given highest priority in the allocation of resources. (CZM, 2011 pp. 61-63)

Not applicable. The Project does not anticipate any dredging activities within channels to any port or harbor facilities. At this time, Mayflower Wind does not propose to implement any port or harbor improvements to support the Project and anticipates using existing ports and facilities that are suitable to support the types and sizes of vessels required for use during construction. Similarly, during O&M of the Project, Mayflower Wind would utilize existing port and harbor facilities that are capable of accommodating the necessary vessels and support activities required during that phase of the Project lifecycle.

Ports and Harbors Policy #3

Preserve and enhance the capacity of Designated Port Areas to accommodate water-dependent industrial uses and prevent the exclusion of such uses from tidelands and any other DPA lands over which an EEA agency exerts control by virtue of ownership or other legal authority. (CZM, 2011 pp. 63-67)

Not applicable. Mayflower Wind is planning to use existing port and harbor facilities that are suitable to support the types and sizes of vessels required for use both during construction, as well as O&M of the Project.

Ports and Harbors Policy #4

For development on tidelands and other coastal waterways, preserve and enhance the immediate waterfront for vessel-related activities that require sufficient space and suitable facilities along the water's edge for operational purposes. (CZM, 2011 pp. 68-70)

The proposed export cables located within state waters, including the cable landfall, will not preclude the use of the immediate waterfront for vessel-related activities or other water-dependent activities. The Project will use an HDD landfall method to minimize impacts to nearshore and coastal waters. During construction, this installation method will require a temporary, short-term prohibition on access to the waterfront within the immediate construction work areas and HDD path for safety reasons. However, there will be no long-term impacts to immediate waterfront areas, public access, or vessel related activities along the waterfront area. As described more fully in Sections 3 and 4 of the MA EFSB Analysis, Mayflower Wind's Preferred Route purposely avoids the Taunton River in order to avoid Army Corp of Engineer's dredged channels, an active wharf, and the boat ramp at Brayton Point.

Protected Areas

Protected Areas Policy #1

Preserve, restore, and enhance coastal Areas of Critical Environmental Concern, which are complexes of natural and cultural resources of regional or statewide significance. (CZM, 2011 pp. 72-75)

Not applicable. There are no Areas of Critical Environmental Concern in proximity to the Project; therefore, the Project will have no effect on Areas of Critical Environmental Concern.

Protected Areas Policy #2

Protect state designated scenic rivers in the coastal zone. (CZM, 2011 pp. 75-76)

Not applicable. There are no designated scenic rivers within the area of the Project, and therefore, there will be no impact on these resources.

Protected Areas Policy #3

Ensure that proposed developments in or near designated or registered historic places respect the preservation intent of the designation and that potential effects are minimized. (CZM, 2011 pp. 76-77)

Mayflower Wind has conducted assessments of historical and archaeological resources within the area of potential effect for the Project. This includes both the terrestrial (onshore) and marine (nearshore and offshore) facilities for the Project. Mayflower Wind has obtained a permit from the MA BUAR to conduct a marine archaeological survey. Marine archaeological surveys were conducted in 2019 and 2020, and supplemental surveys were initiated in 2021 to cover additional areas of the Lease Area and the Brayton Point ECC, among other Project areas. Mayflower Wind has submitted a Project Notification Form to the MHC for the onshore Project facilities, secured a permit from MHC to conduct reconnaissance terrestrial surveys (Phase 1A) and has prepared a Phase 1A Terrestrial Archaeological Resources Assessment for the Project that was filed with the MHC. For Brayton Point, Mayflower Wind submitted a Project Notification Mayflower Wind and completed a reconnaissance terrestrial survey (Phase 1A); the archaeologist concluded that construction of the Brayton Point HVDC converter station, underground cable system and HDD site will not impact significant historic properties eligible to the National/State Registers and recommended no further archaeological investigation.

Mayflower Wind also anticipates conducting surveys, as necessary, within areas identified as potentially sensitive for presence of previously unknown historic or archaeological resources. Potential effects, if any, to historic resources will be addressed with BOEM, the Tribes, MA BUAR, and MHC through established review procedures, and all appropriate measures consistent with Section 106 of the National Historic Preservation Act and state register review process will be taken.

Potential effects, if any, to historic resources will be addressed with BOEM, the Tribes, MA BUAR, and MHC through established review procedures, and all appropriate measures consistent with Section 106 of the National Historic Preservation Act and state register review process will be taken.

For the onshore Project facilities, Mayflower Wind has assessed the potential visual impact of these facilities on historic resources. The underground onshore export cables and transmission cables will have no visual impact on historic resources as the cables will be buried beneath existing paved roadways, and following completion of construction, the only visual indicators of the presence of the cables will be manhole covers within the paved roadway surface.

Similarly, for the onshore Project facilities, Mayflower Wind has assessed the potential visual impact of these facilities on historic resources. The underground onshore export cables will have no visual impact on historic resources as the cables will be buried beneath existing paved roadways, and following

completion of construction, the only visual indicators of the presence of the cables will be manhole covers within the paved roadway surface.

Because the Brayton Point site was previously occupied by the Brayton Point Power Station, the largest coal-fired generating station in New England, historic resources within the viewshed would have previously had views of the power plant's cooling towers (500 ft tall), stacks and other structures. As such, the visual effect of the Project on historic resources is expected to be less impactful than the previous views of the power plant. The HVDC converter station site is not located within any designated or registered historic districts. Beyond the visual effects mentioned above, the onshore construction at Brayton Point is not expected to directly or indirectly affect historic properties.

Public Access

Public Access Policy #1

Ensure that development (both water-dependent and non-water-dependent) of coastal sites subject to state waterways regulation will promote general public use and enjoyment of the water's edge, to an extent commensurate with the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine. (CZM, 2011 pp. 78-87)

The Project, as proposed, will have no appreciable effects on the Commonwealth's interests in flowed and filled tidelands under the Public Trust Doctrine or on the general public's use and enjoyment at the water's edge. The area of landfall is in private property that was formerly used as an industrial site (coal fired power plant), and therefore not commonly used for recreation. During the installation of the export cables there will be a temporary, short-term prohibition on access to the waterfront within the immediate construction work areas and HDD path for safety reasons. However, it is anticipated that the installation of the export cables and landfall construction will take place outside of peak tourism season so as to not interfere with public access to waterfront areas. Additionally, there will be no long-term impacts to waterfront areas or to public access to the water's edge resulting from the Project, particularly for Mayflower Wind's Preferred Route, as discussed in Section 5.

Water Quality

Water Quality Policy #1

Ensure that point-source discharges and withdrawals in or affecting the coastal zone do not compromise water quality standards and protect designated uses and other interests. (CZM, 2011 pp. 92-95)

Construction and installation activities associated with the Project have the potential to impact coastal and marine water quality through structure installations and removal, as well as vessel discharges such as domestic wastewater, uncontaminated bilge water, treated deck drainage and sumps, uncontaminated ballast water, and uncontaminated fresh or seawater from vessel air conditioning. Bilge water discharges may only occur in nearshore and offshore waters provided that the effluent is processed by an approved oil and water separator and the oil content of the bilge water is less than 15 parts per million. Bilge water that cannot be discharged in compliance with regulations will be retained onboard the vessel for disposal at an approved receiving facility back in port. Generally, ballast water is pumped into and out of separate compartments and is not usually contaminated with oil. However, the same discharge criteria for oil content also applies to ballast water. All vessels will be required to comply with federal and state discharge requirements, as well as requirements for the control and prevention of accidental spills, which are detailed in the Oil Spill Response Plan developed for the Project. By complying with these state and federal regulations, it is anticipated that there will be no impacts to water quality.

Within the Brayton Point ECC, burial of the export cables will cause a temporary increase in turbidity. This is not anticipated to be a significant impact, as mapped ocean currents should allow this short-term resuspension of sediment to settle rapidly within the local environment (see Sections 4.6 and 5.2 of the Analysis). The hydrodynamic assessment and sediment transport modeling developed for the Project, considering the speed and direction of localized currents and sediment grain size as the factors most heavily influencing sediment suspension and transport. As part of the federal and state permitting processes under the federal CWA Section 404 and Section 401 Water Quality Certification frameworks, Mayflower Wind will engage with the permitting agencies and comply with the conditions of the permit issued.

Use of the HDD construction technique for installation of the export cables at landfall is proposed to avoid large-scale disturbance of surface and underwater sediments that would have a more significant effect on water quality. However, the HDD activity still has the ability to affect water quality as a result of an inadvertent release of the drilling mud used to lubricate the drill head and help maintain the bore hole during drilling activities. The drilling fluids/muds will be used during the drilling and reaming operation and are used to facilitate the installation of the HDD conduit and cable-feed into the HDD conduit. The main component of the drilling fluids consists of naturally occurring bentonite clay (which is heavier than water with a density of ρ 1.10-1.40), other additives and freshwater. Bentonite is a non-toxic, naturally occurring substance. The clay is insoluble and made-up of small particles that function as a "natural sealant" that fills the native formation surrounding the bore hole. Various non-toxic additives may be added to the drilling fluid to optimize the rheological properties (the deformation and flow of matter). The drilling fluids are recirculated and recycled throughout the HDD procedures.

Any potential inadvertent release of this drilling fluid to coastal waters has the ability to negatively impact water quality and affect marine life. Mayflower Wind will develop and implement an HDD drill fluid management and contingency plan to avoid inadvertent returns before they occur, and to clean up any drill fluid that is released through an inadvertent return to the ground surface. Provisions of this plan will be a requirement that the Project constantly monitor fluid pressures within the borehole and re-assess conditions and potentially re-align the bore path any time there is a drop-in fluid pressure that could indicate the loss of drill fluid to an inadvertent return.

Mayflower Wind will require all vessels to comply with applicable regulations for the prevention and control of accidental spills of fuels, oils, and other hazardous materials. While HDD equipment is located on land, Mayflower Wind will also utilize fuel and oil spill protocols and comply with spill regulations. Mayflower Wind has also included an Oil Spill Response Plan that includes provisions for responding to oil and fuel spills. Other wastes generated during offshore construction and O&M activities, including septage, solid wastes or other hazardous materials (chemicals, solvents, oils, greases, etc.) from equipment operation or maintenance will be temporarily stored and properly disposed of on land or otherwise disposed of in accordance with all applicable regulations.

Construction of the onshore HVDC converter station will be subject to the Massachusetts Stormwater Standards and will be designed with a stormwater management system to adequately manage stormwater runoff originating from these developments. By designing the stormwater management systems in compliance with state regulations pertaining to stormwater, the point source discharges associated with these discrete site developments is anticipated to have no effect on water quality within the coastal zone.

Water Quality Policy #2

Ensure the implementation of nonpoint source pollution controls to promote the attainment of water quality standards and protect designated uses and other interests. (CZM, 2011 pp. 95-98)

Nonpoint source pollution controls will be utilized during the construction and installation of all onshore portions of the Project to ensure that nonpoint source pollution will not affect water quality within the coastal zone. These include construction phase best management practices, such as limiting of vegetation disturbance and soil grading, installation of erosion and sedimentation controls at the limit of work to manage stormwater runoff, implementation of vehicle refueling restrictions within 100 ft (30 m) of wetlands and waterbodies, strict storage and management of oils and hazardous materials incidental to construction activities, and provisions for immediate containment, cleanup, and reporting (as necessary) of any inadvertent releases of oils and hazardous materials.

As part of the National Pollution Discharge Elimination System Construction General Permit for construction project disturbing one or more acres (0.4 ha or more), Mayflower Wind will develop and implement a construction phase Erosion and Sediment Control Plan and Stormwater Pollution Prevention Plan for the onshore Project facilities that includes all of the provisions detailed above and more and establishes requirements to inspect the construction areas on a weekly basis at minimum to determine compliance with the Construction General Permit conditions and the Project-specific Erosion and Sediment Control Plan.

Water Quality Policy #3

Ensure that subsurface waste discharges conform to applicable standards, including the siting, construction, and maintenance requirements for on-site wastewater disposal systems, water quality standards, established Total Maximum Daily Load limits, and prohibitions on facilities in high-hazard areas. (CZM, 2011 pp. 98-100)

If the development of the HVDC converter station at Brayton Point includes a wash/bathroom, these facilities could be connected to a temporary onsite tight tank that would be inspected and emptied on a routine basis, or other appropriate technology to ensure there would be no onsite discharge of wastewater at the Brayton Point facility. A connection to the existing municipal water service would be installed. Temporary sanitation facilities will be provided during construction of the onshore Project components through the use of portable latrines that will be periodically emptied and cleaned by a portable latrine service provider. The offshore facilities will not be manned by any O&M personnel. However, during construction and O&M activities, sanitation would be provided on the service vessels utilized by O&M personnel for transport to the offshore facilities. The transport vessels would hold sewage within holding tanks and dispose of all raw or treated sewage in accordance with all applicable discharge rules and regulations.

6.3.9.3 Conclusion

As described herein, the Mayflower Wind Project has evaluated all applicable enforceable policies of the Massachusetts CZM for the Project to determine if the activities are consistent with those policies. Mayflower Wind believes the Project and related activities comply with the enforceable policies of Massachusetts' approved Coastal Zone Management Plan and will be conducted in a manner consistent with such policies.

6.3.10 Net Zero Emissions Policy

The Project is driven by and directly advances the net zero emissions policy of the Commonwealth and similar public policy requirements in the region. On January 21, 2020, Governor Baker, in his State of the Commonwealth address, announced a goal of net-zero GHG emissions by 2050. On February 26, 2020, the Massachusetts EEA released a Draft Letter of Determination with proposed language to set a 2050

GHG limit designed to achieve net-zero GHG emissions.[36] Extensive comments were received from interested stakeholders on the draft.[37] On Earth Day, April 22, 2020, EEA Secretary Theoharides signed the Letter of Determination, setting the 2050 emissions limit as follows: A level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level.[38] Further, the *2021 Climate Act* codified this net zero emissions policy, and directed the EEA Secretary to create additional roadmaps and propose emissions limits in five-year increments between 2025 and 2050, with the ultimate goal being net zero. The *2021 Climate Act* also sets the interim emissions limit at 50 percent below the 1990 level for 2030 and 75 percent below the 1990 level for 2040.

The Massachusetts 2050 Decarbonization Roadmap (the "Roadmap") was published in December 2020.[39] The Roadmap states that to meet the Net Zero by 2050 goals, "the region will need to dramatically expand its clean and renewable electricity supply."[40] To that end, the Roadmap notes the sizable impact that offshore wind will have in achieving this goal and explicitly notes Mayflower Wind in the context of offshore wind projects already in the pipeline that need to get permitted and built expeditiously.[41] The Roadmap likewise highlights the importance of additional electric transmission infrastructure in achieving net zero GHG emissions in a cost-effective manner, noting that "additional transmission increases access to, and the ability to share, additional low-cost clean energy resources across the Northeast, lowering costs overall."[42] As recognized by the Roadmap, the Project, by delivering energy from the Clean Energy Resource will support the Commonwealth's decarbonization plans by integrating approximately 1,200 MW of clean, renewable energy with the New England transmission grid.

6.4 RESOURCE USE AND DEVELOPMENT POLICIES

The Project will be constructed and operated in compliance with Massachusetts' policies regarding resource use and development and will deliver to the Commonwealth and the region approximately 1,200 MW of renewable clean energy. The Project is consistent with and will further the Commonwealth's offshore wind energy goals embodied in Section 83C of the *Green Communities Act* (c. 169 of the Acts of 2008), as amended by *An Act to Promote Energy Diversity* (c. 188 of the Acts of 2016).

The Project is also consistent with the EEA's 2006 Smart Growth/Smart Energy policy which established the Commonwealth's Sustainable Development Principles, including: (1) supporting the revitalization of city centers and neighborhoods by promoting development that is compact, conserves land, protects historic resources and integrates uses; (2) encouraging remediation and reuse of existing sites, structures and infrastructure rather than new construction in undeveloped areas; (3) protecting environmentally sensitive lands, natural resources, critical habitats, wetlands and water resources and

[36] EEA. 2020. *Request for Comments.* February 26, 2020. Available at https://www.mass.gov/doc/draft-letter-of-determination-on-the-2050-emissions-limit-revised-342020/download.
[37] The public comments can be read here: https://www.mass.gov/info-details/ma-decarbonization-roadmap#2050-emissions-limit:-letter-of-determination-.
[38] EEA. 2020. *Determination of Statewide Emissions Limit for 2050.* April 22, 2020. Available at https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download.
[39] EEA. 2020. *Massachusetts 2050 Decarbonization Roadmap.* December 2020. Available *at* https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.
[40] EEA. 2020. *Massachusetts 2050 Decarbonization Roadmap*, at 56. December 2020. Available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.
[41] EEA. 2020. *Massachusetts 2050 Decarbonization Roadmap,* at 58. December 2020. Available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.
[42] EEA. 2020. *Massachusetts 2050 Decarbonization Roadmap*, at 15. December 2020. Available at https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download.

cultural and historic landscapes; (4) increasing job and business opportunities; (5) promoting clean energy; and (6) implement regional solutions.

As described more fully in Section 5 of the Analysis, the Project will support these principles because, among other reasons, the onshore portion of the Project will be located exclusively within private, previously disturbed land, thus minimizing clearing necessary to accommodate the proposed infrastructure. The Project has also been designed to mitigate impacts to sensitive lands (see Sections 4 and 5 of the Analysis) and will deliver approximately 1,200 MW of renewable clean energy to Massachusetts and New England as part of a regional solution for achieving GHG emissions reduction requirements while creating job and business opportunities. The Project, therefore, is consistent with and advances the Commonwealth's policies regarding resource use and development.

Finally, the Project is also consistent with EEA's climate resilience and adaptation policies.[43] Mayflower Wind is developing the Project in order to, among other goals, assist the Commonwealth in its efforts to improve climate resilience and the ability of the State to support the needs of the population in the face of the growing impacts of climate change. Not only will Mayflower Wind's Project itself be climate resilient, but the increased reliance on renewable clean energy will substantially reduce GHG emissions in the region and help to mitigate the impacts of climate change.

6.5 CONCLUSION

The Project is consistent with the health and environmental protection, resource use and development policies of the Commonwealth, as articulated herein, and the Project advances important climate change, clean energy and offshore wind energy policies and legislative mandates of Massachusetts and the region.

[43] Massachusetts State Hazard Mitigation & Climate Adaptation Plan. 2018. https://resilientma.org/shmcap-portal/index.html#/.

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