United States of America
Before the Department of Energy
Office of Electricity Delivery & Energy Reliability

Application of Clean Power Northeast Development Inc.
For a Presidential Permit
Atlantic Link Project

Prepared For:
Clean Power Northeast Development Inc.
Boston, Massachusetts

Prepared by:
Vanasse Hangen Brustlin, Inc.
South Portland, Maine

September 2017

ATLANTIC LINK

Emera

Table of Contents

Figures

Figure No. **Description** **Page**

Tables

Exhibits

List of Acronyms

ac	Alternating Current
ACHP	Advisory Council on Historic Preservation
ACOE	United States Army Corps of Engineers
BOEM	Bureau of Ocean Energy Management
BMP	Best Management Practices
CPNE	Clean Power Northeast Development Inc.
dc	Direct Current
DOE	United States Department of Energy
EFSB	Massachusetts Energy Facilities Siting Board
EI	Environmental Inspection
EMI	Electromagnetic Interference
EO	Executive Order
FERC	Federal Energy Regulatory Commission
GHz	Gigahertz
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
Hz	Hertz
IPAC	Information, Planning, and Consultation
ISO	Independent System Operator
kV	kilovolt
MA	Massachusetts
MassDEP	Massachusetts Department of Environmental Protection
MESA	Massachusetts Endangered Species Act
MHC	Massachusetts Historical Commission
MW	Megawatt
NB Power	New Brunswick Power Corporation
NHESP	Natural Heritage and Endangered Species Program

List of Acronyms (continued)

NHPA	National Historic Preservation Act
nm	Nautical Miles
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
RFP	Request for Proposals
ROW	Rights-of-Way
SIS	System Impact Study
SHPO	State Historic Preservation Officer
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
WPA	Wetlands Protection Act
XLPE	Cross-Linked Polyethylene

United States of America
Before the Department of Energy
Office of Electricity Delivery & Energy Reliability

Application of Clean Power Northeast Development Inc.
For a Presidential Permit

Introduction

Pursuant to Executive Order (EO) 10485, as amended by EO 12038, and 10 C.F.R § 205.322 et seq., Clean Power Northeast Development Inc. (CPNE), an indirectly wholly owned subsidiary of Emera Inc., hereby submits this application to the United States Department of Energy (DOE) for a Presidential Permit authorizing the construction, connection, operation, and maintenance of facilities for transmission of electric energy at the international border between the United States and Canada. As reflected in this application, and supporting documentation, the Atlantic Link Project (Atlantic Link or Project), is a proposed 1000 megawatt (MW) subsea transmission cable system and associated converter stations and substations, intended to provide an interconnection between the existing transmission systems in Atlantic Canada and Southeast Massachusetts (SEMA). In support of this request, CPNE submits the following information.

Background

CPNE plans to install and operate a subsea, 1000 megawatt, high voltage direct current (HVDC) transmission cable system to deliver clean energy from Atlantic Canada to Massachusetts. The final transmission cable system route is anticipated to be located within rights-of-way (ROW) selected from two current route alternatives and would connect Coleson Cove, New Brunswick, Canada to Plymouth, Massachusetts for a total length of approximately 375 miles, depending on which route alternative is selected. Over 99 percent of the route would be subsea, which would simplify construction, provide enhanced reliability, and reduce cost. A majority of the total transmission cable system route would occur in United States federal waters; however, short sections of the route would traverse Massachusetts state waters for a total of approximately 20 to 34 miles, depending on which route alternative is selected. The total length of the submarine transmission cable system route in US Federal Waters (i.e., areas exclusive of MA State waters) would be approximately 230 miles depending on which alternative route is selected (Figure 1).

Atlantic Link would provide Massachusetts and the New England electricity system with long-term access to clean energy, at stable prices, from new land-based wind farms and from hydro facilities in Atlantic Canada. The Project is being developed in response to a procurement for clean energy mandated by the Commonwealth of Massachusetts under "An Act to Promote Energy Diversity", which was signed into law by Governor Charlie Baker in August, 2016 (Ch. 188 of the Acts of 2016); specifically, in response to a Request for Proposals (RFP) issued March 31, 2017 by electric distribution companies in Massachusetts for Long-Term Contracts for Clean Energy Projects (https://macleanenergy.com/). As articulated in the Act enabling the procurement, the Project would contribute to Massachusetts' legal obligations to reduce greenhouse gas emissions under its Global Warming Solutions Act (Chapter 298 of the Acts of 2008). If the Atlantic Link is not procured in the RFP, the proponent may still develop the Atlantic Link, however this is subject to CPNE's assessment of market conditions at that time. The recently promulgated regulations with respect to Clean Energy Standard in Massachusetts [310 CMR 7.75] is a favorable market development.

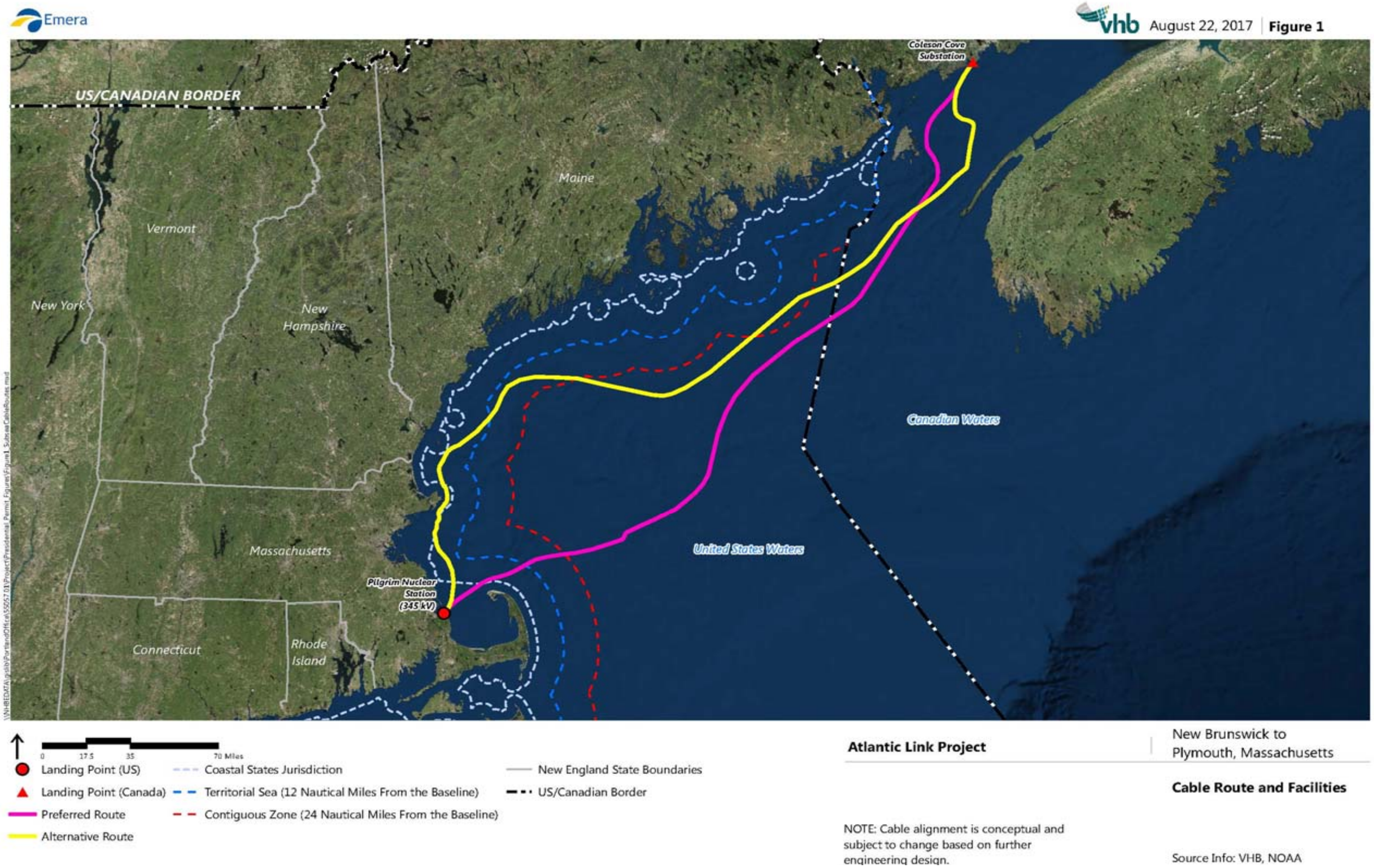


Figure 1 General Area Map Showing the Preferred Route and Alternative Cable System Route

The proposed submerged transmission cable system (comprised of two HVDC cables in a single trench) would be primarily installed via burial device and supplemented with cable protection measures in discrete locations where target burial depths cannot be achieved, for example, due to hard-bottom sea floor. Seafloor surveys and routing analysis during the design process would minimize locations where target burial depths cannot be achieved. The preferred route for the HVDC transmission cable system would be selected to target low-relief areas with gravel, sand, silt, or finer overburden to maximize the potential for cable burial to the target depth and thereby reduce risks associated with external aggression. At the origin of the HVDC transmission cable system in Coleson Cove, New Brunswick, and at the landfall in Plymouth, Massachusetts, upland installation techniques would be utilized over the short terrestrial segments. The HVDC transmission cable system would cross approximately 2,375 feet of land in Massachusetts before terminating at a high voltage direct current (HVDC) converter station and substation site. In the nearshore transition area between upland and subsea, CPNE plans to install the cables using land to water horizontal directional drilling (HDD) construction to avoid impacts to the intertidal zone.

Characteristics of the subsea transmission cables and the expected impacts are discussed generally below; however, exact engineering specifications and route modifications for the Project will be included in subsequent submittals and will be determined based on careful analysis of the purpose of the Project, engineering and environmental constraints, and agency and stakeholder consultation. In addition to CPNE's request for a Presidential Permit, CPNE filed a ROW grant request with the Bureau of Ocean Energy Management (BOEM) in May 2017, and will file an application with the US Army Corps of Engineers (ACOE) in 2018. Other relevant federal, state, and municipal approvals are identified in Table 1.

Table 1 Summary of Required Permits and Authorizations in the United States

Permit or Consultation	Issuing Agency
Federal	
Presidential Permit	U.S. Department of Energy
National Environmental Policy Act Review	Bureau of Ocean Energy Management
Section 10, Rivers and Harbors Act of 1899 Permit	U.S. Army Corps of Engineers
Section 403/404 Clean Water Act Permit	U.S. Army Corps of Engineers
Clean Water Act – National Pollutant Discharge Elimination System Permit	U.S. Environmental Protection Agency
Endangered Species Act Consultation	National Oceanic and Atmospheric Administration Fisheries/ U.S. Fish and Wildlife Service
Marine Mammal Protection Act Consultation	National Oceanic and Atmospheric Administration Fisheries
Magnuson-Stevens Fishery Conservation and Management Act	National Oceanic and Atmospheric Administration Fisheries
Migratory Bird Treaty Act Consultation	U.S. Fish and Wildlife Service
National Historic Preservation Act Consultation	Massachusetts Historical Commission/ Massachusetts Board of Underwater Archaeological Resources
Outer Continental Shelf Lands Act Easement	Bureau of Ocean Energy Management
Clean Air Act Notice of Intent	U.S. Environmental Protection Agency
U.S. Coast Guard Regulations Navigational Risk Assessment	U.S. Coast Guard
Coastal Zone Management Program Consistency Review	Massachusetts Coastal Zone Management Agency
Massachusetts	
Massachusetts Energy Facilities Siting Review	Massachusetts Energy Facilities Siting Board
Massachusetts Environmental Policy Act Review	Executive Office of Energy and Environmental Affairs
Chapter 91 Waterways Regulations License	Massachusetts Department of Environmental Protection
Clean Water Act Section 401 Water Quality Certification	Massachusetts Department of Environmental Protection
Historic Resource Consultations	Massachusetts Historical Commission/ Massachusetts Board of Underwater Archaeological Resources
Massachusetts Endangered Species Act Conservation Management Permit	Natural Heritage and Endangered Species Program
Massachusetts Division of Marine Fisheries Consultation	Massachusetts Division of Marine Fisheries
Massachusetts Wetlands Protection Act Permit	Municipal Conservation Commission/ Massachusetts Department of Environmental Protection
Massachusetts Ocean Sanctuaries Act Review	Massachusetts Department of Conservation and Recreation
Massachusetts Ocean Management Plan	Executive Office of Energy and Environmental Affairs
Municipal	
Zoning Bylaw Variance Approval	Plymouth Zoning Board of Appeals
Local Wetlands Bylaw	Plymouth, and potentially Rockport and Gloucester
Trench Permit – Public Property	Plymouth Department of Public Works
Trench Permit – Private Property	Plymouth Building and Zoning Department

An Environmental Notification Form (ENF) was filed on September 15, 2017 with the Massachusetts Executive Office of Energy and Environmental Affairs. Also at the state level, the Project will be reviewed by the Massachusetts Energy Facilities Siting Board (EFSB), and permits will be obtained through the Massachusetts Department of Environmental Protection (MassDEP), other state agencies, and local conservation commissions (see Table 1). Within Canada, CPNE will seek approval from the National Energy Board and the New Brunswick Department of Environment and Local Government.

A. Information Regarding the Applicant

1. Legal Name of the Applicant

The legal name of the Applicant is Clean Power Northeast Development Inc. (CPNE), an indirectly wholly owned subsidiary of Emera Inc. CPNE is a development company operating in Boston, Massachusetts. CPNE headquarters is located at 101 Federal Street, Suite 1101 Boston, MA 02110. Emera Inc. is an energy company operating in the United States, Canada and four Caribbean countries. The headquarters for Emera Inc. is 1223 Lower Water Street, Halifax, NS Canada B3J 3S8.

2. The Legal Name of all Partners

Clean Power Northeast Development Inc. is 100% owner of the Atlantic Link Project. New Brunswick Power Corporation (NB Power) currently holds an option to participate in this Project as a minority investor. NB Power is a Crown Corporation and a vertically integrated utility with generation and transmission facilities within the Province of New Brunswick, Canada. CPNE and/or its affiliates (which are also wholly owned by Emera Inc.) are currently slated to construct, own, and operate the entirety of the Atlantic Link Project. Development and operation costs will be paid for by CPNE per the terms of various existing or contemplated agreements, and recovered under the terms of a Federal Energy Regulatory Commission (FERC) approved tariff.

3. Communications and Correspondence

All communications and correspondence regarding this Application should be addressed to the following persons:

Dan Muldoon, P. Eng, President
Clean Power Northeast Development Inc.
101 Federal Street Suite 1101
Boston, MA 02110
902-428-6314
Dan.Muldoon@Emera.com

Gerald Weseen, Vice President
Clean Power Northeast Development Inc.
101 Federal Street Suite 1101
Boston, MA 02110
617-530-1309
Gerald.Weseen@Emera.com

4. Foreign Ownership and Affiliations

Emera Inc. is a geographically diversified energy and services company based in Halifax, Nova Scotia with approximately 2.5 million customers, 7,400 employees and $22 billion in assets. The company invests in electricity generation, transmission and distribution, gas transmission and distribution, and utility energy services with a strategic focus on transformation from high carbon to low carbon energy sources. Emera has investments throughout North America, and in four Caribbean countries. Emera's common and preferred shares are listed on the Toronto Stock Exchange and trade respectively under the symbol EMA, EMA.PR.A, EMA.PR.B, EMA.PR.C, EMA.PR.E, and EMA.PR.F. Depositary receipts representing common shares of Emera are listed on the Barbados Stock Exchange under the symbol EMABDR. CPNE is one of Emera's indirectly wholly owned subsidiaries. Emera Inc.'s principal indirectly wholly owned operating subsidiaries are Tampa Electric Company (Tampa Electric), Peoples Gas (a division of Tampa Electric), New Mexico Gas Company, Inc. (New Mexico Gas Company), Emera Maine, Nova Scotia Power Incorporated (Nova Scotia Power), Emera Brunswick Pipeline Company Ltd. (Emera New Brunswick), Barbados Light & Power Company Limited, Grand Bahama

Power Company Limited, Dominica Electricity Services Ltd. (Dominica Electricity Services) , NSP Maritime Link Inc. (NSPML) , Labrador-Island Link Limited Partnership (LIL) and Emera Utility Services Inc. (Emera Utility Services). Emera also directly wholly owns Emera Energy Limited Partnership (Emera Energy) which is also an operating subsidiary. A general description of each operating subsidiary is included below.

Tampa Electric is an integrated electric generation and distribution utility in central Florida with 4,730 MWs of generation and more than 725,000 customers. Peoples Gas is the largest gas distribution company in Florida with 18,700 miles of gas mains and service lines and more than 365,000 customers. New Mexico Gas Company, a natural gas distributor, is the largest utility in New Mexico, serving more than 515,000 customers and operating 12,000 miles of gas transmission lines and mains. Emera Maine distributes electricity to 157,000 customers in eastern and northern Maine and is a member of the New England Power Pool. Emera Energy includes Emera Energy Services, a wholly owned physical energy marketing and trading business; Emera Energy Generation, a wholly owned portfolio of electricity generation facilities in New England and Maritime provinces of Canada; and a 50-percent equity investment in Bear Swamp Power Company LLC, a 600 MW pumped storage hydroelectric facility in Massachusetts. Nova Scotia Power is an integrated generator and distributor of electricity for over 500,000 customers in Nova Scotia. Emera New Brunswick developed and now operates and maintains Brunswick Pipeline, a 90-mile natural gas transmission pipeline connecting the Canaport LNG terminal in Saint John, New Brunswick with the Maritimes & Northeast Pipeline. Emera Inc. also holds a 12.9% interest in Maritimes and Northeast Pipeline Management Ltd. Emera (Caribbean) Incorporated owns Emera's interest in four utilities in the Caribbean, including controlling interest in three utilities - Barbados Light & Power, Dominica Electricity Services, and Grand Bahama Power, which collectively serve more than 180,000 customers. Emera Inc. has interest in two transmission investments related to development of a new 824 megawatt (MW) hydroelectric generating facility in Labrador, scheduled to be generating first power in 2019: 100-per-cent ownership of NSPML, which is developing the Maritime Link, a 110-mile subsea HVDC transmission connection between the island of Newfoundland and Nova Scotia which will be in-service by January 2018; and a 62-per- cent investment in LIL, a transmission project in Newfoundland and Labrador to enable the transmission of Muskrat Falls energy between Labrador and the island of Newfoundland. Emera Utility Services is a utility contractor, primarily operating in Atlantic Canada.

Additional information can be accessed at www.emera.com or at www.sedar.com.

NB Power holds an option to participate in the Atlantic Link Project as a minority investor and may be considered a foreign affiliation. NB Power is the primary electrical utility in New Brunswick, Canada.

All development and operations costs are being paid for by CPNE and/or its affiliates (which are also wholly owned by Emera Inc.). Emera Inc. does not have any intention of transferring, selling or assigning the facility to any other entity.

5. List of Existing Contracts with Foreign Governments or Foreign Private Concerns Relating to the Purchase, Sale or Delivery of Electric Energy

An energy solicitation process for the Atlantic Link Project was initiated in January 2017. This process resulted in the selection of energy sources to be bundled with the Project's transmission service, in response to the Massachusetts Clean Energy RFP currently in process. The purchase, sale, and delivery of energy, will be regulated by the Federal Energy Regulatory Commission (FERC). Power Advisory LLC was engaged as an independent administrator to provide assurance to FERC as to the fairness and transparency of activities related to the solicitation. The applicant, CPNE, will provide a list of existing contracts with foreign entities in a subsequent filing, including any entity that is selling power to CPNE for Atlantic Link.

The applicant's affiliated company, Emera Energy (a wholly owned operating subsidiary of Emera Inc.) through its various subsidiaries, in the ordinary course of business, has several contracts with foreign government entities related to the sale and delivery of energy. These contracts are not related to the Atlantic Link Project. A list of Emera Energy subsidiaries that currently have orders authorizing electricity exports from the United States to Canada from the Department of Energy appears in Table 2. Emera Energy General Partner Inc., as general partner of Emera Energy Limited Partnership, holds Permit EPE-381 from the National Energy Board authorizing the export of firm and interruptible power and energy up to 9,600,000 megawatt hours in any consecutive 12-month period. This permit expires September 16, 2022. Emera Energy Limited Partnership exports power under this permit from its affiliates' facilities and also, from time to time, energy purchased from third parties.

As previously discussed, CPNE may have an affiliation related to the Project with NB Power, a Crown Corporation owned by the Province of New Brunswick, Canada, as NB Power has the option to participate in the Project as a minority investor.

Table 2 Emera Energy Entities That Currently Have Orders Authorizing Electricity Exports from the United States to Canada from the Department of Energy

License No.	Emera Entity	Electricity Exports Effective Date	Expiry Date
EA-321-A	Emera Energy Services Subsidiary No. 1 LLC	10/1/2013	10/1/2018
EA-322-A	Emera Energy Services Subsidiary No. 2 LLC	10/1/2013	10/1/2018
EA-323-A	Emera Energy Services Subsidiary No. 3 LLC	10/1/2013	10/1/2018
EA-324-A	Emera Energy Services Subsidiary No. 4 LLC	10/1/2013	10/1/2018
EA-325-A	Emera Energy Services Subsidiary No. 5 LLC	10/1/2013	10/1/2018
EA-257-D	Emera Energy Services, Inc.	4/5/2014	4/5/2019
EA-287-B	Emera Energy U.S. Subsidiary No. 1, Inc.	4/19/2014	4/19/2019
EA-391	Emera Energy Services Subsidiary No. 6 LLC	5/16/2014	5/16/2019
EA-392	Emera Energy Services Subsidiary No. 7 LLC	5/16/2014	5/16/2019
EA-393	Emera Energy Services Subsidiary No. 8 LLC	5/16/2014	5/16/2019
EA-312-A	Emera Energy U.S. Subsidiary No. 2, Inc.	11/18/2014	11/18/2019

6. Showing Including a Signed Opinion of Counsel, that the construction, connection, operation or maintenance of the proposed transmission facility described herein is within the corporate powers of the Applicant

As set forth in the opinion of counsel attached hereto as Exhibit A, the construction, connection, operation or maintenance of the proposed transmission facilities described herein are within the corporate powers of CPNE. Further, CPNE has complied with, or will comply with, all pertinent federal and state laws related to the construction, operation or maintenance of the proposed Atlantic Link Project.

B. Information Regarding the Atlantic Link Transmission Facilities

A map of the two transmission cable system routes under consideration to connect Coleson Cove, New Brunswick, Canada and Plymouth, Massachusetts, based on preliminary routing analysis, is provided in Figure 1. The Atlantic Link Project would consist of two HVDC cables in a single trench on the ocean floor connected to the HVDC converter stations and substations at two landing points; one in Plymouth, Massachusetts and the other in Coleson Cove, New Brunswick, Canada (see Figure 2). At both locations, the 345 kV substations would interconnect with the existing electric transmission system via a transmission line tap. The technical specifications and design details will be finalized after consultation with agencies and stakeholders, and after an evaluation of engineering data and costs. Other detailed information regarding design, safety standards, access routes and details of the proposed construction methods will be provided in subsequent filings. The subsequent filings will include photographs, parcel maps, and technical specifications of the Project as well as related information should the facility affect the level, flow or content of nearby waters.

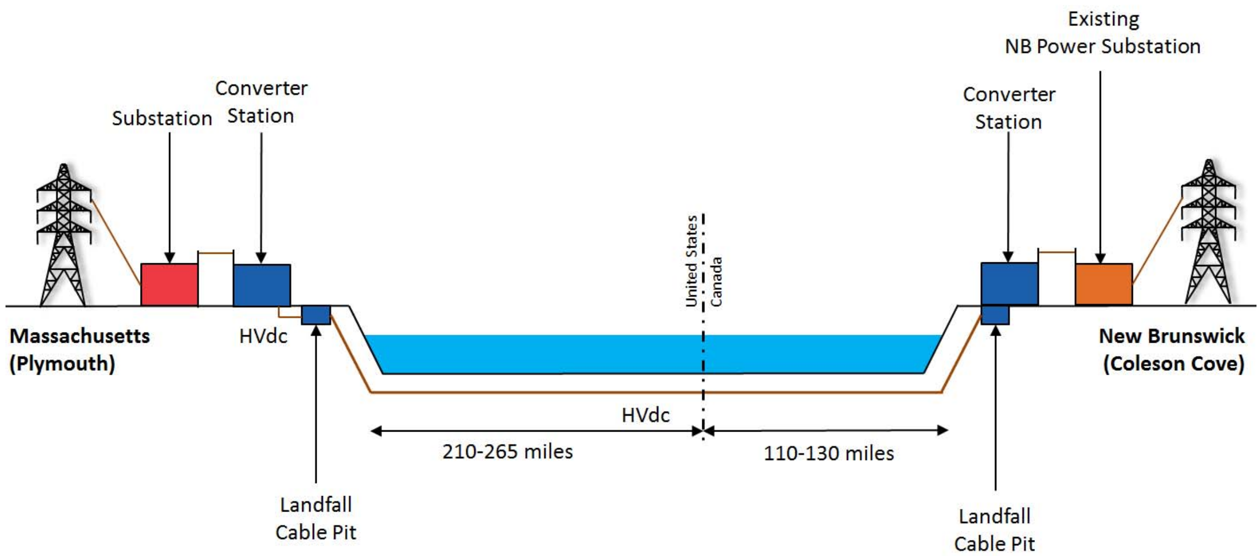


Figure 2 **Atlantic Link schematic showing the HVDC transmission cable system from New Brunswick, Canada to Plymouth, Massachusetts, with connecting converter stations and substations.**

1. Technical Description

A. Number of Circuits

The Project would include one complete circuit with all HVDC components buried or protected. None of the HVDC components are overhead.

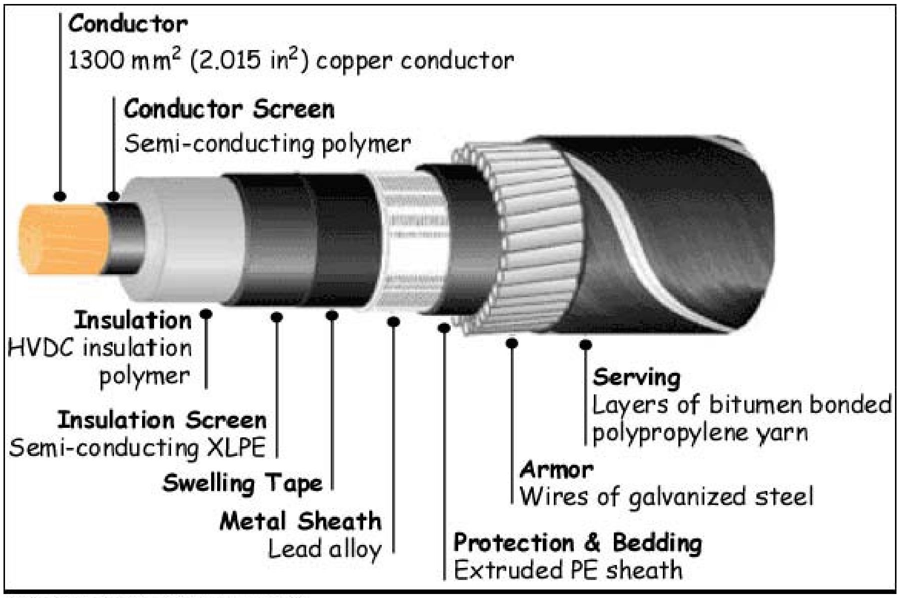
B. Operating Voltage/Frequency

The Project includes a 1000 MW HVDC transmission cable system that would be operated at ±320 kilovolts (kV). An HVDC cable does not operate with a specific frequency. The alternating current (ac) interconnection would operate at 345 kV at a frequency of 60 Hz.

C. Cable Size and Specifications

The subsea transmission cable system proposed for the Atlantic Link Project is two cross-linked polyethylene (XLPE) HVDC cables rated at a voltage of 320 kV. The subsea cables would be bundled and span approximately 375 miles, depending on which route alternative is selected. The subsea cable protection system would consist of a combination of trenching and burial, rock placement and concrete mattressing.

The polyethylene insulation in the XLPE cables eliminates the need for fluid insulation, enables the cables to operate at higher temperatures with lower dielectric losses, improves transmission reliability, and reduces risk of network failure. In general, aquatic transmission cables include a polyethylene sheath extruded over a lead-alloy sheath to provide superior mechanical and corrosion protection (see Figure 3). An armored layer of galvanized steel wires embedded in bitumen provides additional protection for the aquatic transmission cables. The outer layer of the aquatic transmission cables consists of an asphaltic compound with polypropylene reinforcement. Exact specifications of the proposed subsea and upland transmission cable system installation would meet national electric safety code specifications and detailed information will be included in subsequent filings.



Source: Cross-Sound Cable Company 2012

Figure 3 Example of an aquatic HVDC transmission cable cross-section.

D. Direct Current Converter Station and Plymouth Substation Specifications

Detailed plans including both HVDC converter stations in Plymouth, Massachusetts and Coleson Cove, New Brunswick will be included in subsequent filings along with specifications for the associated Plymouth Substation.

2. Installation and Construction Description

A. Land Assets

In the United States, the terrestrial components of the Project would include the buried HVDC cable system extending from the shoreline to the HVDC converter station, one HVDC converter station, a substation, and a transmission line tap. The Project would run from an existing New Brunswick Power 345 kV substation to a proposed building housing the HVDC converter station which would interconnect with the proposed HVDC transmission cable system. The approximately 375-mile long cable system would connect to another proposed HVDC converter station in Plymouth, Massachusetts. From the Plymouth HVDC converter station, ac electricity would be transferred onto the grid via a proposed 345 kV substation and transmission line tap. The proposed terrestrial components within Massachusetts would be developed across approximately 20 acres of forested land. Specifications regarding installation and construction of all terrestrial components will be included in a subsequent filing.

Direct Current Converter Stations and Plymouth Substation

The HVDC converter stations are needed to convert electricity between ac and dc. The HVDC transmission cable system would be configured to run from a proposed HVDC converter station site in Coleson Cove, New Brunswick to a proposed HVDC converter station and substation site near the existing Pilgrim Nuclear Generating Station in Plymouth, Massachusetts (see Figure 1), which is scheduled to be decommissioned in mid-2019. An aboveground high voltage alternating current (HVAC) line would connect the Coleson Cove HVDC converter station to the existing New Brunswick Power 345 kV substation located in Coleson Cove, New Brunswick. The Coleson Cove HVDC converter station would supply electricity to the subsea cables which would then be transferred directly to the Plymouth HVDC converter station site. The Plymouth HVDC converter station would convert the electrical power from dc to ac and the power would be transferred to the proposed 345 kV substation. An aboveground ac transmission line tap would connect the proposed substation to two existing 345 kV ac transmission lines that are presently supplied by the Pilgrim Nuclear Generating Station.

The Plymouth HVDC converter station and substation would be developed on an approximately 41-acre site, although the converter station and substation would occupy only 10 to 15 acres of the site. Construction of the converter station and substation would require site grading and preparation and permanent development of electric transmission infrastructure. Both converter stations would be designed to minimize visual impacts to the local environment and surroundings. Plans, including staging areas, will be included in subsequent filings.

Construction of the proposed Plymouth Substation would be required to connect the HVDC converter station in Plymouth to the existing 345 kV transmission lines located adjacent to the HVDC converter station site. The substation would allow power imported via the Atlantic Link subsea cables to be transmitted within the existing electric transmission grid. The Plymouth Substation plans will be included in subsequent submittals.

HVDC Subsurface Land Cable System

A subsurface land transmission cable system would be constructed within a ROW between the cable system landing point and the proposed HVDC converter station. The HVDC transmission cable system ROW would extend approximately 2,375 feet and would occupy approximately 2.7 acres in Plymouth, Massachusetts and would require only limited associated grading to facilitate equipment access during construction.

Transmission Line Tap

An aboveground ac transmission line tap would connect the proposed Plymouth 345 kV Substation to two existing 345 kV ac transmission lines that are presently supplied by the Pilgrim Nuclear Generating Station. The proposed transmission line tap between the Plymouth 345 kV Substation and the existing 345 kV transmission lines serving Pilgrim Station would involve new transmission structures, but the tap would only be a few hundred feet long and involve a limited number of structures.

B. Marine Assets

Subsea Cables

The Atlantic Link subsea transmission cable system would consist of two 320 kV dc cables, bundled together and buried in the ocean floor. A fiber optic communications cable may also be bundled and buried with the dc cables. The departure point at Coleson Cove, New Brunswick to the landing point in Plymouth, Massachusetts would be approximately 375 miles, depending on which route alternative is selected for the final route. The cables would be bundled together for installation. For most of the route, CPNE plans to bury the cables at a target depth of ideally six feet with a range of 3-6 feet. To the extent that conditions permit, CPNE would install cable primarily using a jet plow/burial device, that uses high-pressure water jets to create a trench (see Figure 4). Cable system installation would be supplemented with transmission cable system protection measures in discrete locations where target burial depths cannot be achieved, such as areas with hard-bottom sea floor. In denser, more compact sea floor conditions, mechanical trenching tools would be employed. Where the transmission cable system cannot be buried, it would be covered with rocks or protective mattressing. Any land portion of the transmission line cable system would be buried and may be protected by a concrete barrier or buried in a concrete duct bank, as necessary.

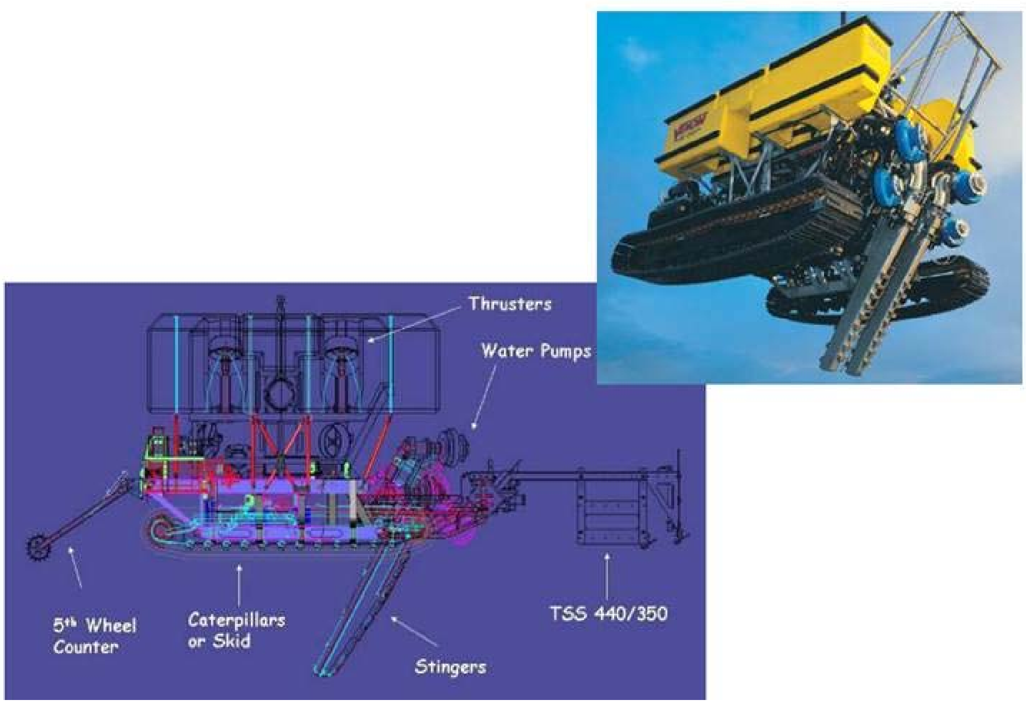


Figure 4 Example of water jet trenching device

Horizontal Directional Drill Landfall Site

HDD construction would be used to install the transmission cable system in nearshore transition areas between aquatic and terrestrial portions of the proposed transmission cable system route at the Plymouth, Massachusetts cable system landfall location. The HDD operation would include an HDD drilling rig system, a drilling fluid collection and recirculation system, and associated support equipment. In subsequent filings, CPNE will provide additional detail on the proposed HDD construction operations. A schematic of a typical HDD landfall drill rig operation is included in Figure 5.

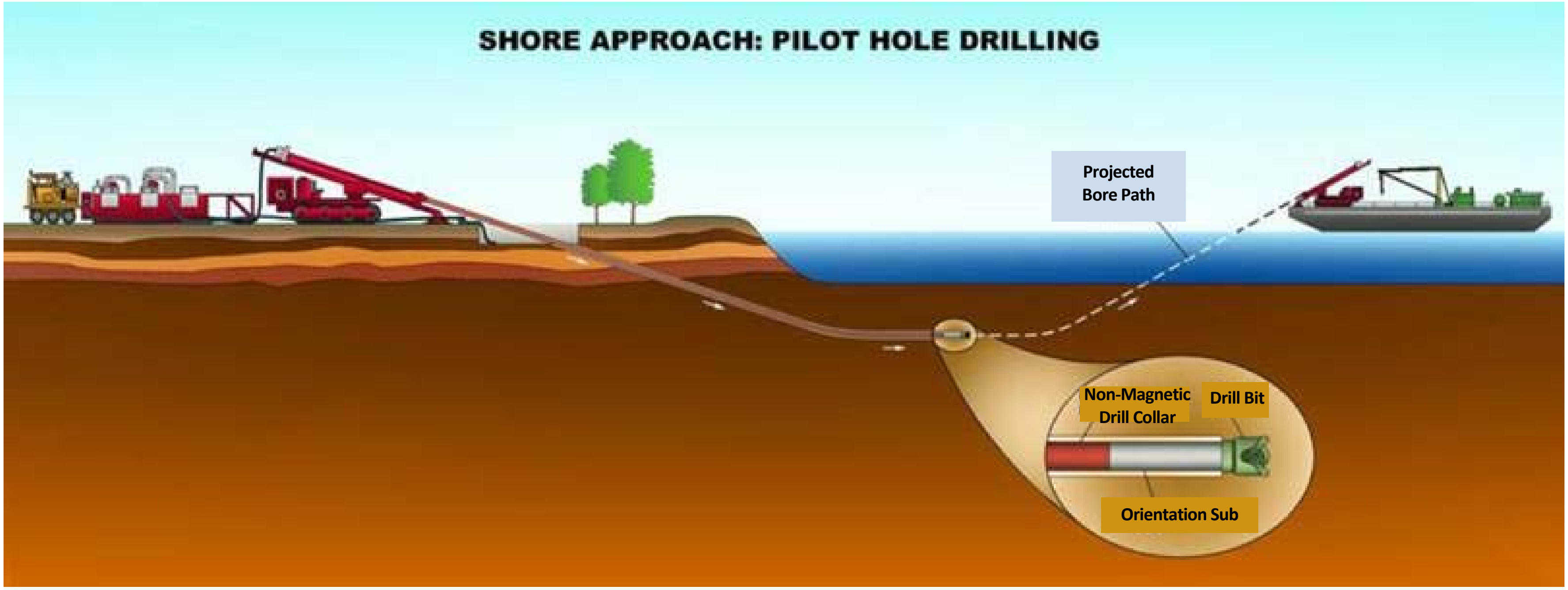


Figure 5 Typical HDD landfall drill rig operation.

C. Potential/Anticipated Problems during Development and Construction

Along most of the subsea transmission cable system route, the cables would be buried at a target depth of six feet, to the extent practicable, to prevent disturbance to the cables from unrelated aquatic operations such as ground fishing and other maritime activities. The actual depth of burial that would be achieved will depend on available construction equipment, sediment types and depth to bedrock, and the types of maritime activities in the vicinity and their potential threat to cable integrity. Where bedrock is near the surface and burial is not practical, protective coverings such as rock placement or concrete mattressing would be installed to protect the cables (see Figure 6).

Figure 6 Typical articulated concrete mattressing used for subsea cable protection in the process of being installed.

Potential constraints to be managed during construction include active shipping lanes, other buried subsea infrastructure, and commercial fishing habitat or operations. During construction, ongoing coordination with agencies that manage and coordinate marine traffic would be required to prevent conflicts. Agency coordination, compliance with permit conditions, and design and engineering would be used to avoid conflicts with existing infrastructure. To address potential conflicts with fisheries, CPNE will coordinate with the National Oceanic and Atmospheric Administration Fisheries Service, other federal and state agencies, and stakeholders to avoid or minimize potential adverse effects on the habitat of federally managed commercial or recreational fisheries. Effects to commercial fishing operations would be minimized through proactive project planning and scheduling based on stakeholder meetings. Currently, CPNE stakeholder consultations are ongoing and will be used to identify areas of concern or potential conflict and will help determine if seasonal restrictions during construction or alternate routes are necessary.

Nearshore at the transmission cable system landing point in Plymouth, Massachusetts, the subsea transmission cable system would be constructed using HDD construction techniques to avoid impacts to the intertidal zone and nearshore marine resources. A potential risk of HDD construction is the inadvertent return of lubricating drilling mud (water and bentonite clay), pressurized within the bore hole, to the seafloor surface. This can create temporary turbidity in the water from suspended sediment. The risk would be mitigated by monitoring the pressure of the drilling mud in the HDD bore hole, and through implementing an approved contingency plan to minimize and contain turbidity and sedimentation.

3. General Area Map

A map of the Project area is included in Figure 1. Among other features, the map identifies the coordinates and ownership of the facilities at the U.S. border with Canada. The alternatives under consideration for the selection of a final HVDC transmission cable system route would be located within the area identified in Figure 1.

4. Applications for Facilities at 138 kV or Higher

A. Expected Power Transfer Rating

The proposed maximum power transfer capabilities of the Atlantic Link project is 1000 MW at the receiving end in Plymouth, Massachusetts.

B. System power flow plots for the applicant's service area during heavy summer and light spring load periods, with and without the proposed international interconnection, for the year the line is scheduled to be placed in-service, and for the fifth year thereafter. The power flow plots submitted can be in the format customarily used by the utility, but the ERA requires a detailed legend with the power flows.

Power flows will be conducted as part of the ISO New England System Impact Study (SIS) conducted for the Project, which will be provided in subsequent submittals.

C. Data on the Line Design Features for Minimizing Television and/or Radio Interference

The proposed HVDC transmission cable system would be far from land and beneath the ocean for most of its length, and the terrestrial components of the cable system and other proposed Project facilities would be buffered from other land uses by several hundred feet of forested land. Due to the proposed distance of the Project facilities from television or radio transmission towers, residences, commercial, and other land uses that may utilize television or radio signals, interference with television and radio signals is not expected. Additionally, the proposed HVDC technology and transmission cable system would be designed to eliminate potential electromagnetic interference (EMI) that could affect television or radio service. The HVDC converter station at Plymouth, Massachusetts would be designed to meet applicable local radio, television, and telephone EMI limits.

Additional details regarding the features required to minimize EMI will be developed during the detailed design phase of the proposed Atlantic Link Project and provided in a subsequent filing.

D. A Description of the Relay Protection Scheme, Including Equipment and Functional Devices

An SIS will describe protection equipment and systems associated with the subsea transmission cable system and will be included in a subsequent submittal. The actual protection design and equipment selection will be part of a Facility Study to be conducted prior to construction. The final design will be subject to approval by the Northeast Power Coordinating Council's Task Force on System Protection.

E. System Stability Analysis

As provided in 10 CFR § 205.322(b)(3)(v), the U.S. Department of Energy may require the

applicant to prepare a system stability analysis following the DOE's review of the power flow plots. CPNE will prepare and furnish the system stability analysis upon request.

5. Construction Schedule

CPNE filed an application for an offshore cable system ROW with the BOEM in May 2017. Applications to the Massachusetts Energy Facilities Siting Board, Plymouth Zoning Board of Appeals, Plymouth Conservation Commission and other applicable municipal conservation commissions will also be submitted during the second quarter of 2018. Applications to other Massachusetts agencies and federal agencies including the U.S. Army Corps of Engineers will be filed in 2018. CPNE plans to have all necessary permits secured during the fourth quarter of 2019 or sooner, and to begin construction during the first quarter of 2020. CPNE anticipates the Project will be in-service during the fourth quarter of 2022. A proposed development schedule including the scheduled construction phase is included in Figure 7.

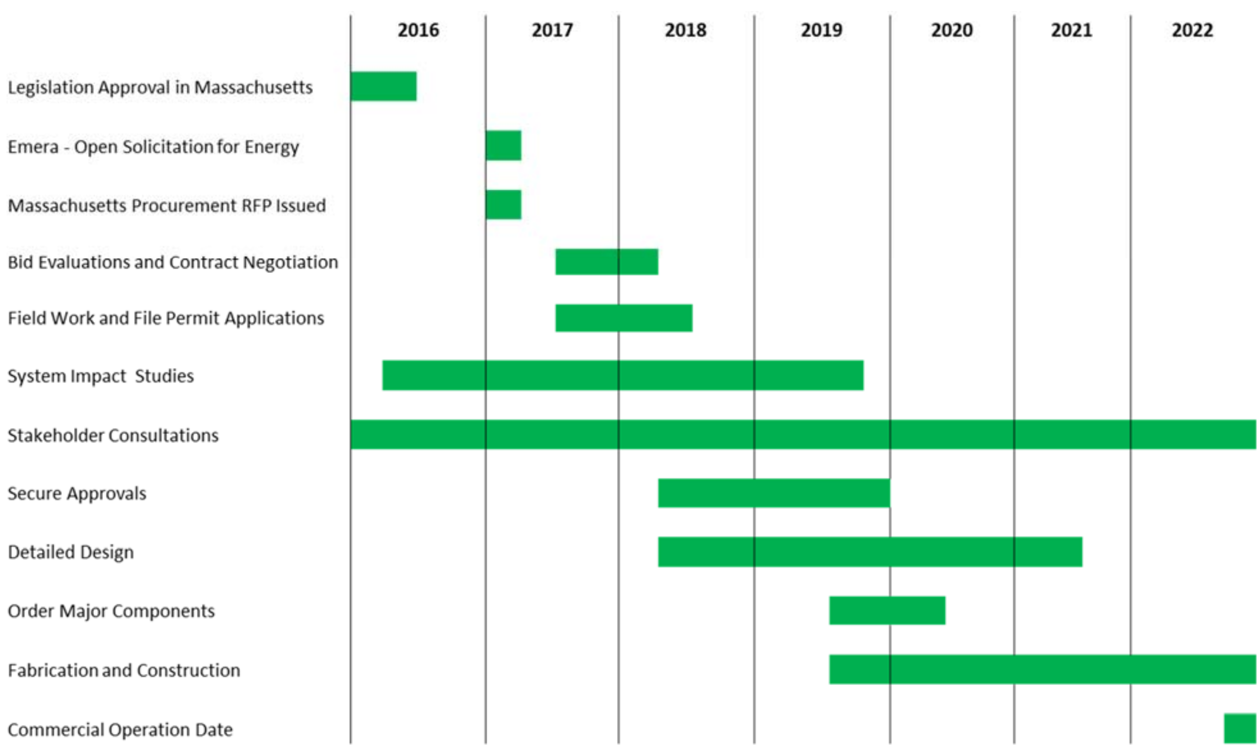


Figure 7 Overview of the proposed Atlantic Link development schedule, including the construction phase, which will span from 2020 to 2022

6. Similar Facilities

CPNE is not aware of any similar facilities in the proposed Project area.

7. National Interest

There is both a public and a national interest in approval of the Project. Atlantic Link would provide Massachusetts and the New England electricity system with long-term access to clean energy, at stable prices, from new land-based wind farms and from hydro facilities in Atlantic Canada. The Project is being developed in response to a procurement for clean energy mandated by the Commonwealth of Massachusetts under "An Act to Promote Energy Diversity", which enacted in August, 2016 (Ch. 188 of the Acts of 2016); specifically, in response to a Request for Proposals (RFP) issued March 31, 2017 by electric distribution companies in Massachusetts for Long-Term Contracts for Clean Energy Projects (https://macleanenergy.com/). As articulated in the Act enabling the procurement, the Project would contribute to Massachusetts' legal obligations to reduce greenhouse gas emissions under its Global Warming Solutions Act (Chapter 298 of the Acts of 2008). The project would offset non-emitting generation that will be lost with the scheduled closure in mid-2019 of the Pilgrim Nuclear Generating Station in Plymouth.

Current congestion on the terrestrial transmission system in northeastern North America limits potential for southern New England states to reliably access additional energy from Atlantic Canada, which has substantial reserves of clean energy. Atlantic Link would bypass that congestion, opening the door to a new and diverse portfolio of non-emitting energy and capacity resources. Increasing penetration in both Canada and the United States of non-emitting but also non-dispatchable generation sources (such as wind and solar) creates impetus for strengthening transmission infrastructure between the two countries, to enable opportunities for more robust system balancing and reserve sharing in a manner that delivers the lowest cost to electricity customers.

Atlantic Link would connect systems with different load peaking characteristics and considerable geographical separation. New England is a summer peaking system. The provinces of New Brunswick, Nova Scotia, and Newfoundland and Labrador are winter peaking systems. At summer peak, New England would have the opportunity to receive and purchase energy, surplus capacity and reserves from winter peaking systems that stretch to Newfoundland and Labrador and Québec, which in summer have opportunity to sell surplus capacity and energy. As well, when storm systems move through the northeast and create emergency operating conditions, the geographic separation of Canadian provinces from New England states means Atlantic Link would provide enhanced reliability and security for all electricity customers.

If the Atlantic Link is not procured in the Massachusetts Clean Energy RFP, CPNE may develop Atlantic Link subject to its assessment of market conditions at that time. The recently promulgated regulations respecting a Clean Energy Standard in Massachusetts [310 CMR 7.75] is a favorable market development.

8. Traffic Impacts from Construction

The Project would not have any significant effect on terrestrial transportation infrastructure. The terrestrial project components would be constructed on undeveloped land adjacent to an existing private road. The Project's terrestrial components in the United States would include construction of a new HVDC converter station and substation, HVDC subsurface transmission cable system, and transmission line tap near the existing Pilgrim Nuclear Generating Station. The Pilgrim Nuclear Generating Station will be decommissioned during 2019, the year prior to when construction for the Atlantic Link infrastructure is scheduled to begin. The Pilgrim Nuclear Generating Station currently employs more than 600 permanent employees and up to an additional 900 temporary employees. The proposed Plymouth substation and HVDC converter station would require an estimated 200 people to be on-site during construction and an estimated two to four people to be on-site during operation. Compared to the current traffic impacts from the existing Pilgrim Nuclear Generating Station, the proposed terrestrial infrastructure would have an insignificant impact on traffic flow in the area, and may even reduce traffic during certain times of the day.

The subsea cable system would cross active commercial shipping lanes outside of Portland, Maine and Boston, Massachusetts, depending on the final subsea cable system route. During construction, ongoing coordination with agencies that manage and coordinate marine traffic within shipping lanes would be required to prevent conflicts between construction equipment and maritime traffic. During Project operations, anchorage of marine vessels over the cables would be precluded due to the potential risk of damaging the cables. Potential construction and operation phase conflicts and concerns will be addressed as part of the stakeholder process and Coast Guard review of CPNE's U.S. Coast Guard Regulations Navigational Risk Assessment application. Pursuant to 33 CFR part 66.0, Subpart 66.01, the U.S. Coast Guard (USCG) has regulatory jurisdiction over projects located in navigable waters of the United States and is responsible for matters related to navigation safety, vessel engineering and safety standards, and all matters pertaining to the safety of the facilities or equipment located in or adjacent to navigable waters. The USCG will coordinate a Navigational Risk Assessment to provide a qualitative assessment of navigational risks related to the proposed Project. USCG review will be required for off-shore components of the Project and any installation in major navigable rivers depending on the crossing technology selected (direct burial or horizontal directional drilling) and the cable's proximity to identified navigation channels and anchoring areas. CPNE will provide the necessary technical analysis and documents required for the USCG to complete a Navigational Risk Assessment. CPNE anticipates the Navigational Risk Assessment will commence during 2018 and be completed by the fourth quarter of 2019.

Following construction, nautical charts would be updated to show the location of the subsea transmission cable system so that mariners are aware of the cable's location. Other subsea energy and communication infrastructure exists near the two Project routes under consideration, especially in Massachusetts Bay where fiber optic cable, liquefied natural gas terminals and pipelines, and other subsea infrastructure is located, and these facilities coexist with existing maritime traffic and activities. The proposed subsea transmission cable system would also coexist with maritime traffic without significant conflicts or problems.

C. Information Regarding Environmental Impacts

1. Statement of the Environmental Impacts of the Proposed Facilities

CPNE has completed a desktop review of natural resources within the project area, and completed site reconnaissance investigations at the proposed terrestrial facilities locations in Plymouth, Massachusetts. Specific information regarding environmental impacts of the proposed facilities will be provided in subsequent filings based on the results of detailed on-site field investigations, where applicable. Most of the Project's potential environmental impacts would occur during construction and site development. Potential environmental impacts from project construction would be related to the subsea transmission cable system installation, the terrestrial transmission cable system, the HVDC converter station, substation, and transmission line taps.

A. Subsea Transmission Cable System Construction

The subsea transmission cable system would be installed generally in soft bottom sediments using a burial device. To the extent that conditions permit, CPNE would install cable primarily using a jet plow/burial device, that uses high-pressure water jets to create a trench (see Figures 8 and 9), however the burial strategy would be determined by the selected installer.

One option is to have the burial device towed along the seafloor by a ship to simultaneously create a trench, lay cable fed to the device from the ship, and infill the trench with native material. Soil conditions would determine the specific type of installation employed. The burial device would allow the cable system installation to proceed rapidly in a single pass of the device with a very limited disturbance footprint. The trench would be less than two feet wide and 3-6 feet deep and would infill immediately as the burial device installs the cables. The cables would be buried to a target depth of 3-6 feet. Suspended sediment would be limited to the immediate installation area. The only direct impacts of the burial device installation to the marine environment are in the footprint of the trench and burial device, and these would be very short-term. Typically, two to four miles of cable can be installed per day using the burial device. The subsea cable would have no significant environmental impacts during operation because it would be buried beneath the seafloor for most of its length.

Figure 8 Picture of a jet plow simultaneously trenching, laying cables, and infilling the trench in soft bottom sediments.

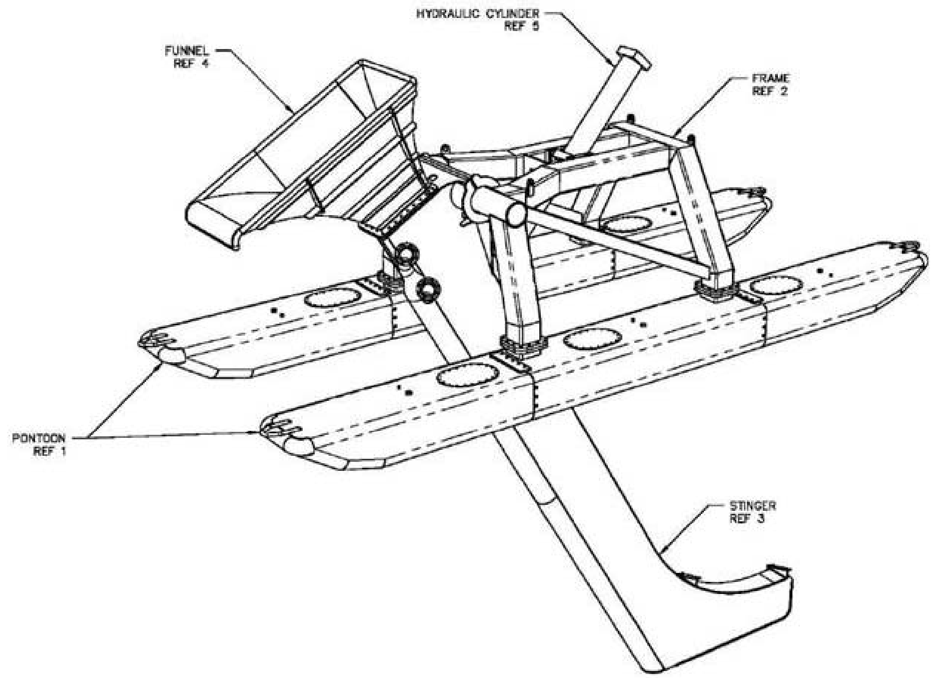


Figure 9 Diagram of subsea transmission cable system installation-jet plow burial device.

Where hard bottom seafloor is encountered and the cable is not able to be buried in marine sediments, the cable system would be covered with protective rocks or concrete mattressing to armor the cable and hold it in-place (see Figure 6). Where the cable system is armored, potential environmental impacts would be limited to the footprint of the protective covering. The locations where the cables must be laid on the seafloor surface and armored would be minimized by pre-construction siting analysis. To date CPNE has completed desktop analysis and preliminary field surveys to identify a cable system route with the highest probability of encountering soft bottom sediments. CPNE will also complete detailed pre-construction field surveys and field data collection to maximize cable system installation in soft bottom sediments that can be trenched rather than laid on the hard seafloor bottom.

A short segment of the cable system would be installed using the horizontal directional drilling installation technique where the cable system approaches the landfall location in Plymouth. HDD installation involves a guided drilling device that bores and reams a hole through the subsurface between a subsurface entry and exit location. The HDD construction would be a 'land to water' installation (see Figure 5), where the drilling device would penetrate the ground surface from a terrestrial starting point and exit the seafloor at a suitable location. The cable system would be attached to the drilling device and pulled back through the subsurface HDD path to the terrestrial starting point to complete the cable system landfall. The advantage of HDD installation is that the cables can be installed with no disturbance to the seafloor, the terrestrial surface, and nearshore resources (i.e., beaches, dunes, eelgrass beds, and marshes), except where the HDD enters and exits the ground or seafloor at the start and end points. This minimizes impacts to valued and protected shoreland, water, and wetland resources.

As discussed previously, a potential risk of HDD installation is the inadvertent return of lubricating drilling mud (water and bentonite clay), pressurized within the bore hole, to the seafloor surface. This can create temporary turbidity in the water from suspended sediment. The risk would be mitigated by monitoring the pressure of the drilling mud in the HDD bore hole, and through implementing an approved contingency plan to minimize and contain turbidity and sedimentation.

The principal environmental impact risks related to subsea cable system construction are related to spawning and essential fish habitat disturbance, harassment or injury to threatened, endangered, or protected marine species (i.e. marine mammals), and offshore sanctuary and cultural resources (i.e., Stellwagen National Marine Sanctuary, Massachusetts Ocean Sanctuaries, or shipwrecks). The proposed subsea transmission cable system route would be sited to avoid and minimize crossings and impacts to protected areas and species associated with them (see Figure 10).

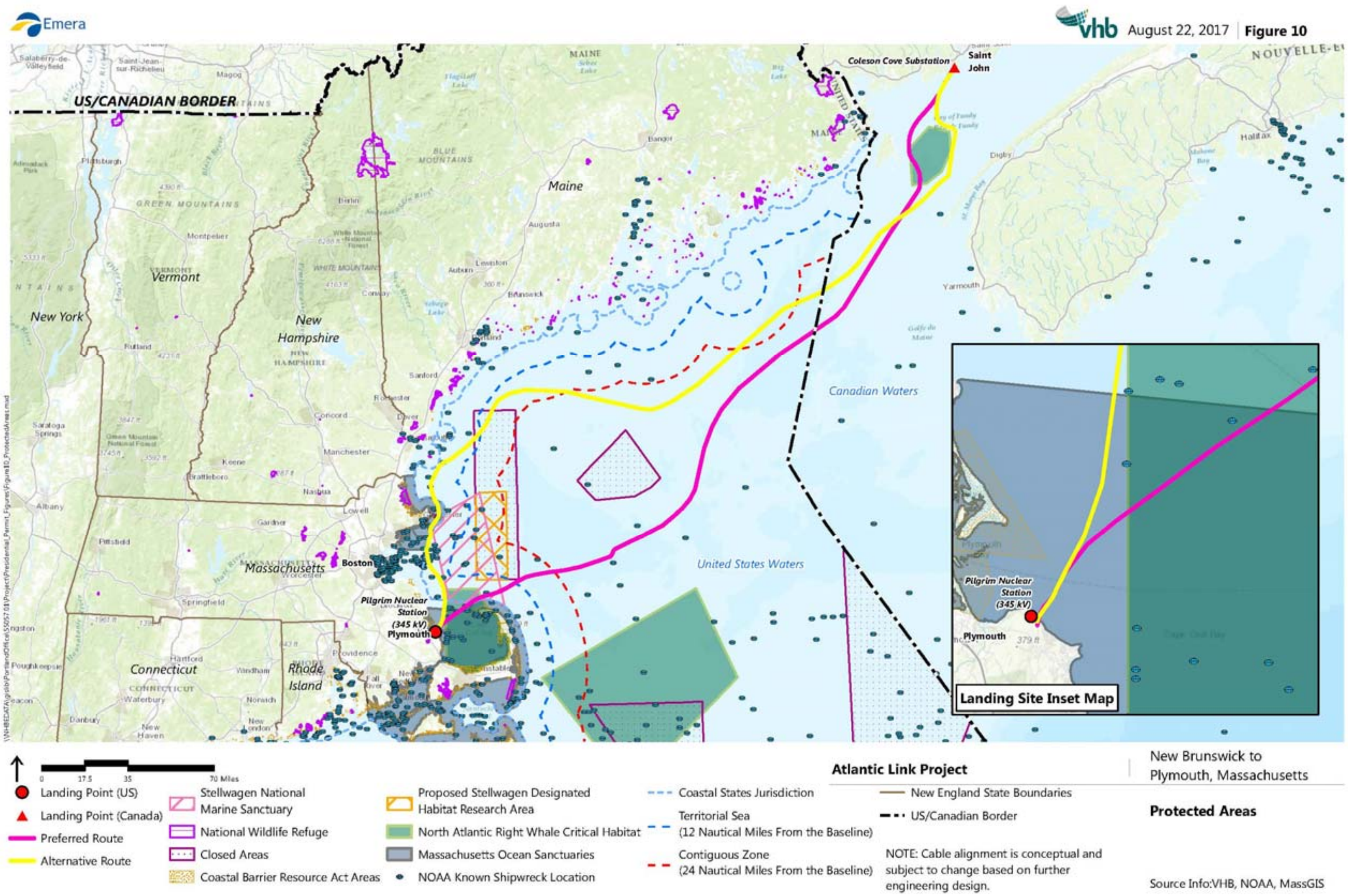


Figure 10. Map of the proposed subsea cable system and major environmental and cultural resource routing considerations such as Massachusetts Ocean Sanctuaries, Stellwagen National Marine Sanctuary, right whale protection areas, and shipwrecks.

The potential for impacts to marine resources will be fully evaluated, minimized, and mitigated through numerous permit authorizations and agency consultations. Key among these will be consultations with National Oceanic and Atmospheric Administration Fisheries, Massachusetts Department of Marine Fisheries, Massachusetts Board of Underwater Archaeological Resources, and Massachusetts Historical Commission under laws and regulations including the Marine Mammal Protection Act, the Endangered Species Act, Magnuson Stevens Fishery Conservation and Management Act, and the Massachusetts Ocean Sanctuaries Act.

B. Terrestrial Cable HVDC Converter Station and Substation Construction and Transmission Line Tap

Terrestrial components of the Project include the buried HVDC transmission cable system, HVDC converter stations, the Plymouth Substation, and electric transmission line taps. The location of these proposed facilities in the United States is shown in Figure 11. Construction of these elements of the Project have the potential for short-term environmental impacts. The sequence of project construction would generally follow:

- Clearing and vegetation removal;
- Grading and site preparation;
- Construction; and
- Site restoration.

The HVDC cables and transmission line tap ROWs in Massachusetts would occupy approximately 2.7 acres and would require only limited associated grading to facilitate equipment access during construction. The HVDC converter station and substation site in Massachusetts would occupy approximately 10 to 15 acres of an approximately 41-acre site and would require site grading and preparation. Following construction, the HVDC cables and transmission line tap ROWs would be maintained in a shrub-meadow cover type.

Figure 11 **Map of proposed terrestrial HVDC cable ROW, HVDC converter station and substation, and electric transmission tap in Plymouth, Massachusetts.**

The HVDC converter station and substation would be permanently developed with electric transmission infrastructure.

Potential construction-phase environmental impacts would be minimized by adhering to construction Best Management Practices (BMPs) and permit conditions, and implementation of an Environmental Inspection (EI) Program. Key elements of the BMPs and EI program would include implementation of erosion and sedimentation controls, a spill prevention and countermeasures plan, regular environmental inspections and coordination between environmental compliance and construction personnel.

C. Floodplains and Wetlands

Floodplains

The subsea cables would cross the Federal Emergency Management Agency VE Flood Zone located along the shoreline of Cape Cod Bay. Construction or operation of the HVDC cables would not impact the VE Flood Zone because the cables would be installed beneath the seafloor and intertidal zone ground surface using HDD construction methods that would not result in ground disturbance or site alteration.

Wetlands

Wetlands that occur within the Project footprint would be delineated, and CPNE will provide maps and information regarding identified resources in a subsequent filing when these field investigations are completed. As the subsea component of the HVDC transmission cable system approaches a landing point, the potential for encountering coastal wetlands exists before coastal uplands are reached. Coastal wetlands are transitional areas between upland shores and the open sea, and include such features as eelgrass beds, salt marshes, beaches, and intertidal flats.

Coastal wetlands within the Project area are protected by federal, state, and local laws, and review of impacts to coastal wetlands by regulatory agencies will be completed during the review of the Project's wetland and water resource permit applications to federal, state, and local agencies. Impacts to coastal wetlands would be avoided or minimized to the extent feasible given their high ecological value and associated regulatory protection. This would specifically be accomplished by using HDD construction techniques to avoid direct disturbance to coastal wetlands. Figure 12 identifies the location of coastal wetlands identified by publicly available maps near the proposed cable system landing point in Plymouth, including tidal marshes and eelgrass beds.

Freshwater wetlands are also regulated under federal, state and local environmental laws. Wetlands types include marshes, wet meadows, bogs or swamps, vernal pools, banks, beaches, lakes, ponds, rivers, streams, and land subject to flooding. Potential impacts from Project construction activities include clearing, grading, excavation, or filling of wetland resources, while project operation may require periodic vegetation maintenance in and around wetlands in ROW areas. Impacts to wetlands would be minimized through facility siting efforts, use of construction BMPs and erosion and sediment controls, and adhering to permit requirements. Depending on the wetland resource, activities in or near wetland resource areas are regulated by often overlapping federal, state and municipal jurisdictions.

With the use of HDD technology to construct the proposed subsea cable system landfall and the aboveground facility siting and routing procedures that are being applied by CPNE, significant impacts to wetlands or waterbodies are not anticipated.

Figure 12 Publicly mapped coastal wetlands near the proposed HVDC cable system landing point.

D. Critical Wildlife Habitat

Federally Protected Critical Habitat

As part of the federal project review, in coordination with the Bureau of Ocean Energy Management (BOEM), CPNE has consulted with the U.S. Fish and Wildlife Service (USFWS) and will continue to consult with the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service to identify critical habitat for species protected under the Federal Endangered Species Act. Based on desktop investigation completed to date, CPNE has identified critical habitat for the North Atlantic right whale within the project vicinity. No other critical habitat for species protected under the federal Endangered Species Act has been identified in the Project area, although this will be confirmed through agency consultations.

The North Atlantic right whale population is critically endangered and is believed to number approximately 400 individuals in the western North Atlantic Ocean. Three areas of designated right whale critical habitat are located within the Gulf of Maine. One of these areas occupies most of Cape Cod Bay, a second area occupies an area of Canadian waters at the mouth of the Bay of Fundy, and a third area is located southeast of the project area in the Atlantic Ocean. Right whale critical habitat within the Gulf of Maine is identified in Figure 10. In addition to designated right whale critical habitat, NOAA identifies several right whale seasonal management areas. These include broad areas east of Cape Cod and within and north of Cape Cod Bay. The purpose of the seasonal management areas is to require reduced marine vessel speeds during certain times of the year within these areas to prevent ship strikes of right whales.

State Protected Habitat

In Massachusetts, in addition to federal protections to species listed under the federal ESA, state-designated Priority Habitat is based on the known geographical extent of habitat for all state-listed rare species, both plants and animals, and is codified under the Massachusetts Endangered Species Act (MESA). Habitat alteration within these Priority Habitats may result in a take of a state-listed species, and is subject to regulatory review by the Natural Heritage and Endangered Species Program (NHESP). Estimated Habitats are a sub-set of the Priority Habitats, and are based on the geographical extent of habitat of state-listed rare wetland wildlife and is codified under the Massachusetts Wetlands Protection Act (WPA). State-listed wetland wildlife species are protected under the MESA as well as the WPA.

Priority and Estimated Habitat maps are used for determining whether a proposed Project must be reviewed by the Massachusetts NHESP for MESA and WPA compliance and can be found in the Massachusetts Natural Heritage Atlas. CPNE's preliminary review of the Massachusetts Natural Heritage Atlas has not identified any Priority or Estimated Habitat within the footprint of terrestrial project facilities. CPNE's review did identify Priority Habitat located in the coastal waters around proposed HVDC cable system landing location and one other Priority Habitat, at Scokes Pond, which is further than 1 mile from the proposed converter station site (see Figure 13). As part of state and federal permitting procedures CPNE will consult with the USFWS and the NHESP to confirm whether additional investigation into potential rare species or habitat is needed.

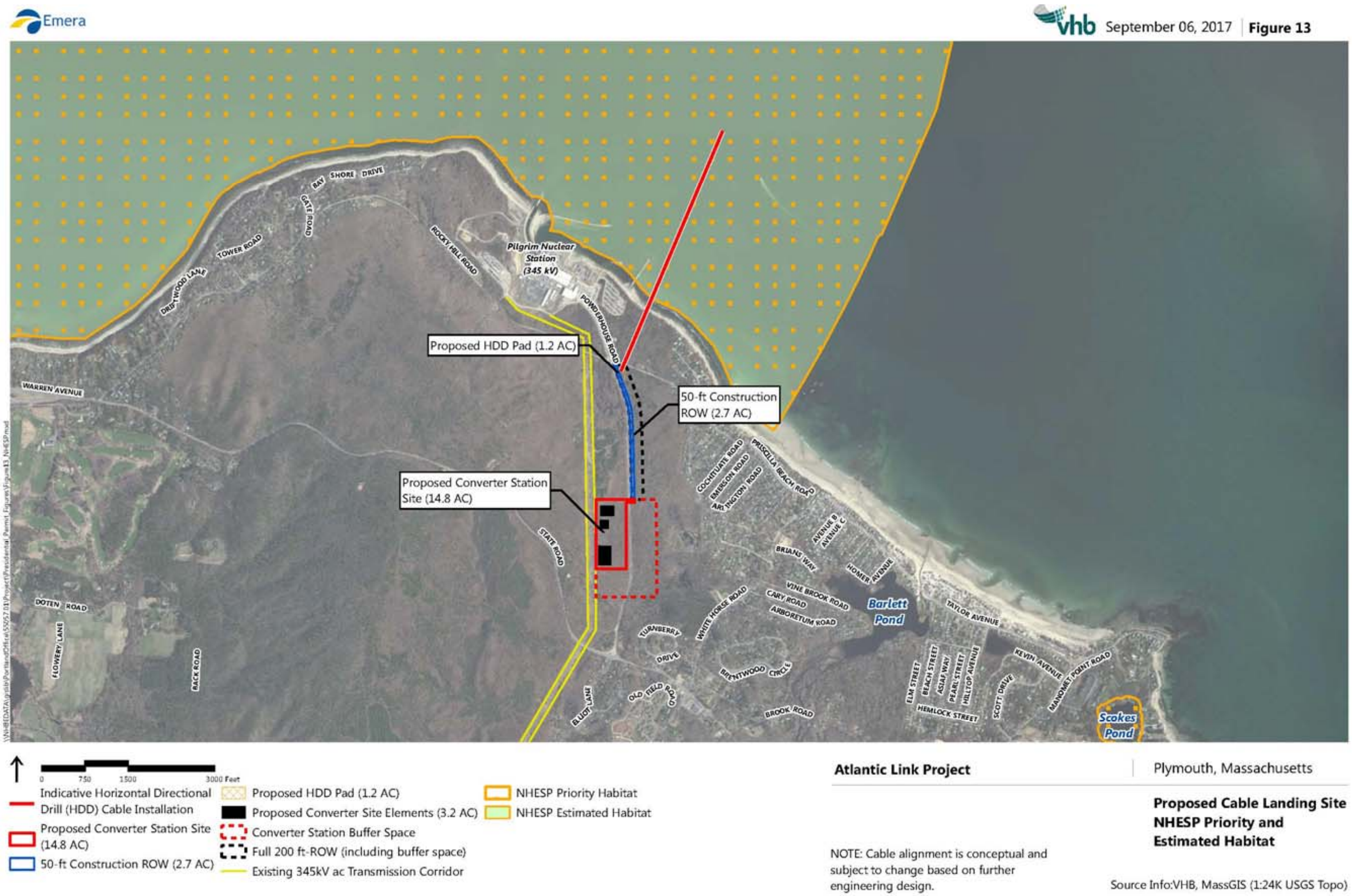


Figure 13 State-designated Priority Habitat and Estimated Habitat near the proposed cable system landing location and terrestrial facilities.

E. Navigable Waterway Crossings

The HVDC cable system would cross the Gulf of Maine portion of the Atlantic Ocean, which is the only navigable waterway crossing that would occur within the project footprint. A navigable waterway within the United States, over which the ACOE has jurisdiction, includes all ocean and coastal waters within a zone three nautical miles seaward from the baseline (Title 33 CFR § 329.12). The baseline is defined as where the shore directly contacts the open sea during ordinary low tide.

F. Indian Land

The Project would not be constructed or operated on land owned by Indian tribes.

G. Historic Sites

Marine Historic Resources

The Gulf of Maine has a history of maritime use spanning hundreds of years, and is known for the capacity to generate hazardous seas. As such, many shipwrecks exist within the waters of the project area, and the location of only some of them are known. Shipwreck locations as identified by NOAA nautical charts are displayed on Figure 10. It is understood that the mapping does not display all shipwreck locations, as some locations are unknown. CPNE will obtain additional information on the location of shipwrecks through consultation with the office of the State Historic Preservation Officer (SHPO) in Massachusetts, Maine, and New Hampshire. CPNE will also use an archeological marine survey to identify existing shipwrecks in the proposed construction ROW. The proposed HVDC cable system route would avoid shipwrecks not only for constructability purposes, but also to respect cultural resources and because disturbance to such areas would require extensive review by and consultation with the respective SHPO.

Terrestrial Cultural Resources

Cultural resources include above-ground historic resources such as buildings and archaeological resources. For projects undergoing federal review, where above-ground historic resources are present within an "area of potential effect" including a project development site and the surrounding area, then the impact on these resources must be considered such as alteration of viewshed or direct impacts to structures listed or eligible for listing on the National Register of Historic Places. If archaeological resources are present at a project site, then ground disturbance must also be considered as a potential impact.

The Town of Plymouth is of historical significance and has known cultural resource sites. While the location of many above-ground architectural and historic resources is available through public databases, the location of known archaeological resources is not publicly available, and consultation with the Massachusetts Historical Commission (MHC) and file research will be required to determine whether known archaeological sites are within the project area. Even if there are no known archaeological sites, the MHC may require archaeological testing and field investigation prior to ground disturbance if the project facilities are located within an area that is likely to contain archaeological resources based on its environmental and historic setting.

As part of project compliance with Section 106 of the National Historic Preservation Act (NHPA), in coordination with the BOEM as the lead federal agency, CPNE will consult with the MHC to establish an area of potential effect for the Project, and the scope of any necessary architectural and archaeological field investigations to confirm whether the Project will impact cultural resources.

2. A List of Known Historic Places

The goal of the National Historic Preservation Act of 1966 is to have federal agencies act as responsible stewards of the nation's resources when their actions affect historic properties. Section 106 of the NHPA requires the lead Federal agency to consider the effects of its projects on properties listed on or eligible for listing on the National Register of Historic Places (NRHP), including prehistoric or historic sites, districts, buildings, structures, objects, or properties of traditional religious or cultural importance, and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the Project.

Cultural resources and the effects on those resources will be evaluated by the State Historic Preservation Officer in conjunction with the lead Federal agency. In Massachusetts, the SHPO is the Executive Director of the Massachusetts Historical Commission. For the off-shore component of the Project, the Massachusetts Board of Underwater Archaeological Resources will also play a significant role during the NHPA review. CPNE will collect historic property and archaeological field data needed for Atlantic Link, prepare associated reports, and provide information to support the Bureau of Ocean Energy Management's consultations with the Massachusetts Historical Commission, the Massachusetts Board of Underwater Archaeological Resources, and Native American Tribes. CPNE will also provide the Bureau of Ocean Energy Management with historic and cultural resource information needed for the Bureau of Ocean Energy Management to complete consultations with the ACHP.

3. Minimum Rights-of-Way for Construction, Operation and Maintenance of the Transmission Line

HVDC Subsea Transmission Cable System ROW

The proposed subsea HVDC transmission cable system ROW authorized by BOEM would be 200 feet wide where it crosses both federal and state waters. CPNE will complete additional field studies to verify existing conditions along the proposed route, ensure constructability and establish a final ROW. The use of a subsea cable system marine route would reduce landowner impacts compared to a land-based transmission line route.

Terrestrial ROW

The subsea HVDC transmission cable system would connect to a short terrestrial ROW in Plymouth, MA. The extent of land clearing required for the short section of terrestrial ROW, substations, and converter stations will be calculated as the final project design is prepared based on engineering, reliability, applicable requirements, and discussions with stakeholders. The proposed terrestrial ROW includes the HVDC subsurface land cable system, which would be located within a 200-foot wide ROW including a 50-foot wide cleared area and a 150-foot wide forested buffer. It is possible that 25 feet of the 150-foot forested buffer will be needed during construction and thus be cleared. The 25-foot construction ROW would be adjacent to the 50-foot wide ROW and would revert to forested habitat after construction. The cleared portion of the ROW would be approximately 2,375 feet long and encompass approximately 2.7 acres of land. Similar ac projects and pipeline projects require a 50-foot wide permanent ROW width, which is standard. Consideration would be given to safety including any nearby road traffic, visual buffering, and the operation and maintenance requirements of the Project.

4. Threatened or Endangered Wildlife or Plant Life

Based on an Information, Planning and Consultation (IPAC) System Review through the USFWS, CPNE has identified five species that are federally listed as threatened or endangered under the Endangered Species Act have the potential to occur in the Project area. These species, also recognized by the state of Massachusetts as threatened or endangered, are listed in Table 3, and include, two species of shorebird, one freshwater turtle, one whale species and one species of bat. According to the IPAC review, North Atlantic Right Whale (Eubalaena glacialis) critical habitat is wholly or partially within the project area and is under the USFWS jurisdiction. Fifty-six species of migratory birds that are of conservation concern are expected to occur in the Project location. Other species may be included in the list of threatened or endangered species after further review with NOAA and the Massachusetts NHESP, which will be addressed after further consultation with these agencies.

Table 3 IPAC System List of Federally Threatened and Endangered Species Potentially Occurring within the Project Area

Common Name	Scientific Name	Federal Status	MA State Status	Species Information
Land Turtles				
Plymouth Redbelly Turtle	*Pseudemys rubiventris bangsi*	E	E	Within Massachusetts the Plymouth Redbelly Turtle lives primarily in freshwater ponds and rivers that have suitable basking sites and abundant aquatic vegetation.
Birds				
Red Knot	*Calidris canutus rufa*	E	E	The Red Knot uses sandy beaches and intertidal zones of Massachusetts as feeding grounds.
Roseate Tern	*Sterna dougallii*	E	E	Nesting habitat for the Roseate Tern occurs within Massachusetts, this consists of sandy rocky islands and ends of long barrier beaches. Nest sites typically have dense vegetation and shallow sandbars/shoals which are used as feeding areas.
Bats				
Northern Long-eared Bat	*Myotis septentrionalis*	E	E	The Northern Long-eared Bat prefers to roost in clustered stands of large trees and occasionally in house structures. Foraging habitat can be found along forest corridors or edges and near small ponds or streams.
Whales				
Northern Right Whale	*Eubalaena glacialis*	E	E	Right Whale nursery areas are in shallow, coastal waters, specifically between 20° and 60° latitude

E = Endangered

D. A Brief Description of Practical Alternatives and General Impacts

The purpose of the Project is to provide a source of clean energy to the Commonwealth of Massachusetts and to fulfill Massachusetts' legally-required efforts to reduce greenhouse gas emissions under its Global Warming Solutions Act (Chapter 298 of the Acts of 2008). Once complete and operational, Atlantic link would provide an electric transmission route sufficiently distinct from any other existing transmission facility and would function as a reliable energy transfer facility, reduce line losses and thereby achieve associated environmental and economic benefits, and improve access to competitive electric power generation sources to provide benefits to New England consumers.

Possible engineering alternatives to the proposed Project include alternative HVDC transmission cable system landing locations, and alternative HVDC transmission cable system route alternatives to avoid the following resources: protected areas and marine sanctuaries, fishery habitat, shellfish habitat, endangered species critical habitat, shipwrecks, hard marine bottom and bedrock, areas with the potential to support deep sea corals, marine navigation and commercial fishing interests, coastal and freshwater wetlands, and existing terrestrial land uses. These resources and other engineering and logistical constraints have all been considered in CPNE's evaluation of cable system landing point alternatives and HVDC cable system route alternatives, and continue to be evaluated as CPNE selects the final HVDC cable system route and generate design plans for the HVDC cables ROW, substation, HVDC converter station, and transmission line tap facilities. Currently, there is a preferred route and an alternative route selected for the Project (see Figure 1); however, CPNE considered several routing alternatives for the Project. CPNE is currently preparing a comprehensive alternatives analysis narrative describing the alternative cable system landing points and HVDC cable system routes and the rationale for their elimination as required by federal and state permit applications. This analysis will be submitted to the DOE in subsequent filings, however a list of alternative subsea cable system landing points that have been considered and eliminated by CPNE, is included below (See Figure 14).

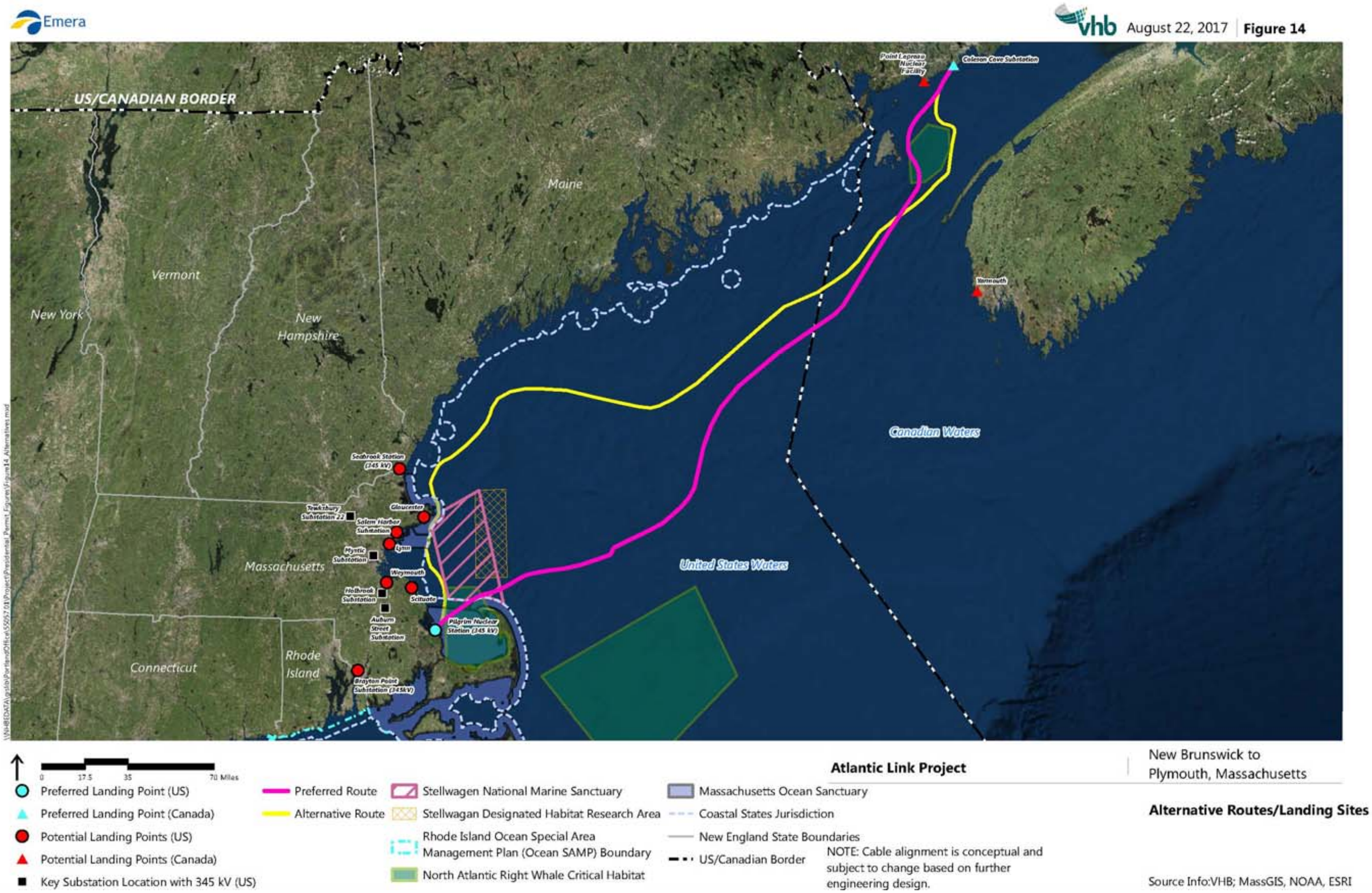


Figure 14 Alternative routes and landing points in the United States and Canada, the preferred landing points are shown in light blue.

1. A List of Considered Alternative Subsea Cable System Routes

Alternative #1 (Seabrook)

Alternative #1 was potentially the least constrained offshore HVDC transmission line corridor. The major protected areas and constraints located offshore from Massachusetts could be avoided by landing the cables further north in New Hampshire, if geotechnical and other subsea site conditions allowed. However, the subsea cables would still need to cross the proposed Stellwagen Designated Habitat and Research Area (DHRA) and reference area, which could preclude the siting of subsea cables in this location. Nearshore constraints include the presence of extensive salt marshes, potential for eelgrass habitat, and a rivermouth at Hampton Harbor. These constraints could potentially be avoided by employing HDD techniques to land at Seabrook Station with sufficient depth to avoid being disturbed or damaged by periodic dredging operations at the Hampton Harbor river mouth. Terrestrial constraints for this alternative are based around the need to establish a new HVDC ROW, which would require landing at Salisbury Beach, Massachusetts. Potential constraints associated with the new ROW include dense residential and commercial development along part of the route, potential for seasonal construction constraints in an area that is heavily used for coastal summer tourism, potential for impacts to wetlands, streams, vernal pools, and rare species, and potential for having to manage disturbance of contaminated soil along a railroad ROW. From an electrical system stability perspective, it was determined that landing at Seabrook would result in the need for system upgrades in the form of additional high voltage line needing to be constructed, thereby increasing terrestrial environmental impacts and burdening landowners.

Alternative #2 (Gloucester)

Alternative #2 was eliminated based on having the worst landing point for interconnecting with the existing 345 kV system. Alternative #2 would potentially need to cross the northern part of both the Stellwagen National Marine Sanctuary (NMS) and the Stellwagen DHRA and reference area, while the preferred alternative only crosses a short portion of the southern part of Stellwagen NMS and not the DHRA. Nearer to shore, this alternative would also cross the North Shore Ocean Sanctuary. The potential for geotechnical constraints is also high in the Cape Ann vicinity, with a very rocky shoreline, numerous offshore islands formed on bedrock, and a very shallow depth to bedrock in many areas. This alternative would also require siting the HVDC cables through Gloucester Harbor, which is a very active and busy commercial and recreational harbor. Upon landfall, this alternative lacks suitable existing electric transmission infrastructure, lack of a ROW suitable for collocation, dense residential and commercial development, and again, a shallow depth to bedrock throughout much of Cape Ann. From an electrical system stability perspective, it was determined that landing at Gloucester would result in the need for system upgrades in the form of additional high voltage line needing to be constructed, thereby increasing terrestrial environmental impacts and burdening landowners.

Alternative #3 (Salem Harbor)

Alternative #3 presented constraints related to the potential need to cross the proposed Stellwagen DHRA and reference area, as well as the North Shore Ocean Sanctuary. Other nearshore constraints would also be encountered to reach the Salem Harbor Station site and included dredged channels, anchorage areas/berths, and the potential for shallow bedrock. A significant terrestrial constraint associated with the Salem Harbor landing point is the need for new electric transmission capacity. The site is situated next to a densely-populated area in the northeastern section of Salem, with residences abutting the site to the west and north, and historic districts in the vicinity. The addition of a new 345 kV line would be challenging to site given the density of the existing development and limited available ROW.

Alternative #4 (Mystic Substation)

Located in Lynn, just south of Salem Harbor, Alternative #4 presented constraints similar to Alternative #3 related to the potential need to cross the proposed Stellwagen DHRA and reference area. However, unlike Alternative #3, a suitable location to site an HVDC converter station could not be identified. Additionally, substantial urban construction and system upgrades would be required for this option.

Alternative #5 (Weymouth to Holbrook)

Alternative #5 was the most challenging site from a nearshore siting perspective due to the presence of extensive subsea infrastructure within inner Massachusetts Bay, sewer lines and outfalls, and an historic/abandoned industrial dumping site. Against this backdrop of a complicated nearshore construction environment were substantial terrestrial and offshore siting constraints, including crossing the middle of the Stellwagen NMS and potentially the proposed Stellwagen DHRA, as well as the North Shore Ocean Sanctuary and the South Essex Ocean Sanctuary; crossing very active shipping and boating areas; and limited available land for construction of an HVDC converter station at the existing Holbrook Substation.

Alternative #6 (Scituate Harbor)

Alternative #6 was eliminated due to a combination of terrestrial, nearshore, and offshore siting constraints. While Alternative #6 would likely require a similar offshore route to that of the proposed landing site in Plymouth due to their proximity, Alternative #6 would offer none of the added benefits of an ideal 345 kV interconnection site that is provided by Alternative #7 (Brayton) and the proposed landing point in Plymouth. It would require crossing the commercial shipping lane to Boston Harbor. Within Scituate harbor, there is extensive recreational and commercial marina activity and a maintained and periodically dredged channel, and the sheltered embayment has the potential to support valued coastal resources including tidal marshes, intertidal flats, and eelgrass beds. Terrestrial siting challenges include constrained space at the Auburn Street Substation for construction of an HVDC converter station, and the need to establish new ROW along municipal roads and the existing 115 kV ROW to the Auburn Street Substation.

Alternative #7 (Brayton)

As with Alternative #1, Alternative #7 would avoid designated right whale critical habitat, the Stellwagen NMS, all Massachusetts waters including Ocean Sanctuaries and Ocean Management Plan areas, and offshore infrastructure in the vicinity of Massachusetts Bay. However, approaching nearshore waters, this alternative would encounter designated "areas of particular concern" and exclusion zones specified in the Rhode Island Ocean Special Area Management Plan, and state water use designations under the jurisdiction of the Rhode Island Coastal Resources Management Council. This alternative would also cross natural resources including two aquaculture sites, a shellfish management and spawning area, and a productive commercial quahog fishery; and existing infrastructure including cables and a natural gas pipeline.

2. General Discussion of Transmission Line Environmental Impacts

Construction and maintenance of the Project would have both temporary and permanent environmental impacts on the existing habitats and associated ecological communities. The temporary effects are related to the construction activities required to develop the terrestrial HVDC transmission cable system ROW, the new HVDC converter stations and substation, and the transmission line taps. These temporary effects would include, vegetation clearing, temporary soil disturbance, trenching, general construction activities, and equipment and ship operation during construction and cable placement. These impacts would be relatively minor, short-term, and local in scale. Temporary construction impacts would be minimized through several mitigative measures, depending on the specific construction activity, including:

- Development and adherence to a detailed erosion control plan for land-based construction;
- Scheduling, to the extent practicable, to avoid construction during particularly sensitive times for certain resources or competing uses (e.g., nesting, spawning, or breeding periods, and commercial fishing seasons);
- Compliance with environmental permit conditions; and,
- Implementation of an environmental inspection and monitoring program during construction.

Permanent environmental impacts related to the subsea transmission cable system are expected to be insignificant. In most locations, the cables would be buried three to six feet below the seafloor. Where the cables are unable to be buried due to seafloor conditions, the cable system would be covered with rock or protective concrete cable mat placement (see Figure 6). The area of seafloor permanently affected by rock or concrete cable mat placement would be very small and dispersed across the length of the cables.

Permanent terrestrial habitat effects would result from the conversion of forested cover types to developed impervious surface related to the converter stations and substations. The proposed HVDC transmission cable system landing point, cable system ROW, HVDC converter station and substation, and transmission line tap in Massachusetts would be located on currently undeveloped forested land. Species of oak (*Quercus spp*.), white pine (*Pinus Strobus*), and pitch pine (*Pinus rigida*) are predominant tree species at the site. The vegetation cleared for the ROW and other areas that would not be converted to impervious surface would be maintained in an early successional scrub-shrub cover type during Project operations through periodic maintenance. It is expected that herbaceous and short woody vegetation such as meadowsweet (*Spirea alba*), bracken fern (*Pteridium aquilinum*), lowbush blueberry (*Vaccinium angustifolium*), highbush blueberry (*Vaccinium corymbosum*), raspberries (*Rubus spp*.), blackberries (*Rubus spp*.), and several sedge and grass species would dominate the maintained clearings in the ROW and other project areas. This long-term conversion of forested cover types to shrub or herbaceous types can offer certain benefits to some wildlife species, including succulent grasses and flowering plants for grazing animals, the production of more fruit for wildlife consumption from berry producing species, and the direct benefits of food, cover, and nesting sites for species dependent on early successional habitats.

Additional discussion of Project impacts on the environment has been provided in Section C.1 of this application. Specific environmental impacts and issues associated with the Project will be identified and analyzed with various state and federal agencies and stakeholders, and provided to DOE in subsequent submittals.

WHEREFORE, CPNE respectfully requests that the DOE approve CPNE's Presidential Permit application authorizing the construction, connection, operation, and maintenance for the facilities described herein for the transmission of electric energy at the international boundary between the U.S. and Canada.

Respectfully yours,

____

Dan Muldoon, P. Eng
President
Clean Power Northeast Development Inc.

____

Date

Before me appeared Dan Muldoon, who, being duly sworn, did testify that the forgoing was true and correct to the best of his knowledge and belief.

____

Exhibits

Exhibit A

Opinion of Counsel